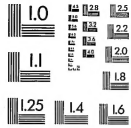
MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



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Thomas A. Edison Papers

A SELECTIVE MICROFILM EDITION

PART IV
(1899–1910)

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START

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A Note on the Sources

The pages which have been filmed are the best copies available. Every technical effort possible has been made to ensure legibility.

Notebook, N-03-10-05.2

F. L. Dyer

Tests made in Engineering Laboratory on the mixed metals.

Tests made:

No 1. S + Cu (80 + 20); was poured, way 600°C, mixed and cast into ingot, cooled in air, rolled cold to 1/8 in. (18° – 20°C.) Smooth and [illegible]

No 2. S + Cu (80 + 20); was poured, way 177°C. mixed + cast into ingot. Smooth and taken out as usual, perfect.

No 3. S + Cu (80 + 20) way 177°C, poured + cast into ingot. Smooth and taken out as perfect, very fine metal.

No 4. S + Cu (60 + 40); was poured into ingot; smooth and [illegible]

No 5. S + Cu (70 + 30); way 177°C. poured + cast into ingot; smooth and [illegible] ingot

No 6. S + Cu. (65 + 35); way 177°C. poured + cast into ingot, smooth and easily taken out.

No. 7 S + Cu (50 + 50); way 177°C. poured + cast into ingot; after [illegible] poured + also opp. to Cape Infantry [illegible]

G. L. Apps

The [illegible] was, the [illegible] A coat of the wax.

Results:

A. Cylinders Nos. 1, 2, 3, + 5 had a mottled appearance & showed crazing near under [illegible] ~~[illegible]~~ Nos. 4 + 6 had a [illegible] structure. Since 65% S is the maximum

B. The ~~[illegible]~~ mould was lost & cylinders of gold, [illegible], it was [illegible] attacked at the high temperature of casting, as shown by all the cylinders having a green layer ~~[illegible]~~ on the surface, due to copper attacked by the sulphuric acid.

C. Tap water (18°–20°C) was not cold enough to effect the shrinking out of the wax. In all cases it was necessary to ~~[illegible]~~ plunge the mould with wax into ice water (ca. 4°C) to take out cylinders. Even then the shrinkage was not great enough to allow of taking out the cylinders freely, & scratching against the mould being distinctly felt.

G. L. Spencer

D. Cylinders then fitted on the machine.

No 1. was found to have the cylinder in the proper way, by mistake.

No 2. Gave very earthly sound and was very rapidly (By 3 or 4 reproductions) worn by the stylus — as distinctly, when under the microscope.

No. 3. Gave very rotatory sound and under the microscope, found very rough record and wearing by stylus after 3 or 4 reproductions.

No. 4. The record was found to have been filled in the upper part, (nearly one of one) and not filled in the lower half; the record was smooth where filled and rough where not filled. The reproductions left distinct marks of wearing after 4 reproductions.

No 5. The cylinder did not fill the record, was irregular, and was rapidly worn by reproductions.

No 6. This was smooth, the record was not filled, the record was partly destroyed by the heating necessary to get the cylinder off. It was considerably worn

F. L. Ryan

by 4 reproduction.

Hence, Nos. 2–6 (i.e. all ~~[illegible]~~ examined) were found to be extremely soft and to be worn by reproduction in 3–4 reproductions.

E. The melting-point of the commercial used ("Mitchell's") was found to be 56°. Its solidifying point was found to be 50–52°.

The melting-point of the cerezin used was found to be 52°.5–53°.5 C. Its solidifying point was found to be 50°–52°.5 C.

Cylinder No. 6. was then examined as to altered separation of the gradients ~~[illegible]~~ : a few milligrams were gently [illegible] off the outside layer and the melting-point determined. It was found to melt gradually between 46° & 52° C. It was found to solidify gradually on cooling between 47° and 43° C.

A few milligrams were then scraped away from the inside of the cylinder wall (about half way in). The solid

F. C. Roper.

fication-point was found to be 45° to 43°C.
no difference whatever being seen in the
mode of solidification, in the and of the
outside Cap.

It was therefore concluded, 1. that
the outside Layer and the mass of the
Cylinder were identical in composition,
2. that no separation of the ingredients
takes place, 3. that no such separation
and no distribution takes place at a
temperature, as alloyed, intermediate
between the melting-point or the
solidification-point of the ingredients,
both the melting-point and the solidifying
-point of the mixture being, respectively,
lower than those of either of the ingredients.

First Work in Oct, 1903 -
Further determination of melting-point
Sol. No 4. Outside Layer, M.P. 50°C. Sharp
Solid. P. 47.5 - 44°C. Cols broken non-
homogeneous, because of slow cooling.
No 4. Inside Layer. M.P. 50°C.
Solid. P. 48°.0 - 44.5 C.

No. 3. Outside layer. mp: 49°–49.5°C.
Solid. f. point: 46° – 43°C (perfect opacity ~~when cooled~~ only at a too little lower temp.).

Frank L. Dyer.

No. 3. Inside layer. mp. 51.5 – 53.5°C.
Solid. point: 51.5 – 47° (~~when cooled~~ turning white very slowly after that, white only below 40°C. A similar phenomenon, i.e. a second crystallization, must have taken place also in other cylinders examined, but was missed) –

No 5. Outside layer. mp. 51°–53°; solid point: 49° – 47.5 (whiteness much lower)
No. 5. Inside layer

Gymn L. Boyer

7

M.P. determination by capillary method:

30 g. S + 20 g. cresol were melted in a glass beaker and the solidifying point was determined: the substance began to crystallize at 52.5°C.; the temperature gradually fell to 45°C., remained stationary at this point, then rose fairly rapidly to 45.5°, again remained stationary, then slowly fell to 47°, remained stationary (?), the whole being now in a pasty condition in the centre of the beaker and ~~pasty~~ quite solid at round the edges. At 46.5° the temperature was stationary for a long time. When it was seriously any longer possible to move the thermometer, the temperature was about 46.5°C. - 45°C.

Further experiments, with superheating done in apparatus like the one described in the patent; mixture was 65% steam acid and 35% cresol.

Exp. 1. Apparatus superheated. The melted mixture poured in, heat continued for ca. 15 minutes, then ~~[illegible]~~ ~~Ordinary separation [illegible] maintained for ca. 30 minutes~~ rapid

current of cold tap water turned on and maintained until the wax in the mould was solidified inwardly to within a very small distance from the core; mould, core, & wax then taken out, core removed and mould with wax replaced in the cooling jacket. After this the current of cold tap water was maintained for ca: 30 minutes; on careful examination, the wax showed no sign whatever of shrinking away from the mould. It was then kept in melting ice for about 15 minutes and then it was possible to remove the cylinder. The cylinder showed signs of powerful attack of the copper, being of a deep green hue. The cylinder is marked No. 8

Exp. 2. Now the mould & core were gently warmed. The wax was melted on the water bath and introduced into the mould. The mould, core, & wax were placed in the jacket, & the superheating & chilling were carried out as in the preceding experiment. The results were the same as before, except: a. The green

longitudinally

Garnock Dyes

9.

coloration of the cylinder was not so deep; b. the cylinder cracked, while the mould was in the melting ice. The cylinder is marked No. 9.

Exp. 3. The experiment was repeated for the purpose of obtaining a cylinder that was not cracked. This time there was irregular ~~of~~ cracking in several points, but the cylinder did not break open; it was kept for trial on the photograph — microscopic inspection. It is marked No. 10. Cylinder No 10 was unsuccessfully injected.

Exp. 4. The ~~wax~~ mould was now then gently heated (~~a~~ about the temp. of the mixture), the wax melted on the water bath & introduced into the mould. The latter was then chilled on the outside with ice water, the core taken out as early as possible, & the chilling continued until the wax shrunk away from the mould sufficiently for removing. The cylinder is marked No 11. (No jacket used)

Exp. 5. A smooth core was now employed.

and an ordinary mould (with thicker shell) was used. The preceding experiment was repeated, with the same result, except that it was a little more difficult to remove the cylinder, the top half of which cracked off irregularly. The cylinder is marked No. 12.

Exp. 6. The same experiment was repeated, with same result. The cylinder is marked No. 13.

Exp. 7. A cast was now made with the regular white-blank composition. The moulds and core were heated by a flame, the wax was heated until limpid, introduced into the mould, & ~~as~~ as soon as possible the core was removed; on the application of ordinary tap water to the mould, the wax soon shrank away & was removed. The cylinder is marked No. 14.

Exp. 8. Exp. (7) was repeated, again with uncracked core and thin mould. Cylinder shrank away from the mould pretty easily. The cylinder is marked No. 15.

Journal & Exp.

Exp. 9. Experiment (8) was again repeated with threaded core. The cylinder came out better, without any crookedness. It is marked No. 16.

Exp. 10. Experiment (8) was repeated with a mixture of 75 parts of cerium and 25 parts of stearic acid. The cylinder came out better. It is marked No. 17.

Exp. 11. A mixture of 65 parts of stearic acid and 35 parts of cerium when heated to 177° C. (350° F.) : no bubbles were given off.

Microscopic Examination of Cylinders 7—17 by Mr. Edison Oct. 12, 1903, who said:

No. 7. One part of record fair, other part dull, torn, rough, apparently not filled, seems as if gas formed on surface in place. The record has a blue tinge also is cracked.

No. 8. Record very green; bits of gold torn off the mould; surface dull, dirty, seems

Finish & Paper

to be well filled; part of a cavity [illegible] part dull; looks as if surface [illegible] [illegible].

No. 9. Part of record very blue; cracked whole length; very dull surface; doesn't look as if it filled anywhere; very poor.

No. 10. Cracked; very bad; dull surface generally; very blue; good torn off; large patches of record torn and rough; very poor.

No. 11. Some of good torn off; surface rough; not shiny; has torn appearance over large area; cracked; very bad record; blue tinge.

No. 12. Shows good torn from sound on bottom end; long; the direct scratches from removing and from sound; surface generally dull; pretty well filled; crack in record.

No. 13. Record with cracks; some torn parts in it; not very shiny; seems pretty well filled; some places there are orgs

Francis L. Dyer

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caught

No. 14. Gets torn off mould slightly; little dull at top end; fills pretty well; looks fair under microscope.

No. 15. Cracks in spots; bad surface; torn; not filled in places.

No. 16. Dull surface; green or blue tinge; some parts very shiny, others dull, with torn appearance; a few cracks of gold torn off; cylinder intact, but cracked.

No. 17. Crystalline or torn and rough surface; does not seem to be filled; dull on one side, brighter on other side in places; chipped, probably stuck to mould in places. Top pouring end very bad surface, bottom better; fairly shiny, but surface torn. One inch from bottom the surface is not shiny and is torn.

---

60 g. 5 + 40 g. Cerasin melted, thoroughly mixed; a sample sucked up into a capillary tube, & m.p. determined; result: 49°-50°C.

Now may have been impure, melting somewhat

Observation. The mixture was introduced [illegible] into a [illegible] gently warmed mortar, allowed to solidify & then subjected to superheating. (i.e. No 18). Same of No. 19.

below 49°C., but it only became distinct at 49°C – Solid. p. 45°.5–44°C. (in capillary tube) The solid-point of the same mass in a beaker was as follows: first appearance of crystals at 51.5 or 52°; then gradual fall of temperature to almost 5 45°, then gradual rise to 49°, remained long stationary at 48.5°, then temperature of paste-like mass gradually fell to about 45°C. The usual mixture [illegible] but the one described on p. 7.

No 18. A mixture ~~[illegible]~~ was cast in ~~[illegible]~~ mortar (4917) heated in glycerin bath to 177°C for some time & then plunged into cold water. Smooth core was closed at the bottom with a cork stopper. The composition of the mixture was ~~[illegible]~~ that (65.35) that had been used in Exp 11 (p. 11). The heating was stopped before all bubbling ceased.

No 19. 91.5 + 49 ger. (= 65.35) were heated as in preceding experiment, but until all bubbling had ceased. The

core was left open, so that both superheating & chilling, were done both from the inside and from the outside. After this the mould was carefully examined under the microscope. It was found to have been badly attacked by the wax.

Analysis:

Residue of wax from casting No. 19 was melted up and two samples taken in the liquid state, from well mixed mass.

1. Weight of sample A . . 1.0370 g.
2. " " " B . . . 1.0095 g.

A thin outermost layer was then scraped away from cylinder No. 19, and weighed as 'sample C'.

3. Weight of sample C . . 0.7880 g.

Finally, as a check, a sample of stearic acid was taken (Sample D).

4. Weight of sample D . . 0.9935

~~To see~~ The four samples were then

titrated in alcoholic solution with a ca. 1/10 N. alcoholic solution of KOH and phenol phthalein as an indicator. The numbers of cubic centimeters of alkali required to neutralize the four samples were as follows:

5. Sample A . . . 7.85 cc.
∴ 1g. A = 7.59 cc. alkali

6. Sample B . . . 7.72 cc.
∴ 1g. B = 7.65 cc. alkali

Average ∴
1.g. was = 7.62 c.c. alkali

7. Sample C . . . 6.00 cc.
∴ 1g. C = 7.61 cc. alkali

8. Sample D . . . 11.64 cc.
∴ 1g. D = 11.72 cc. alkali

7.62 is 65 per cent. of 11.72.

Conclusions: 1. The analytical method used is very good and would easily show a difference of 1%; 2. The outside layer of the cylinder is identical in composition.

with the mixture employed in coating the cylinder, and hence a separation of the ingredients is seen not to take place.

Determination of ~~the~~ Point at which a film can form on the mixture.

1. Glass apparatus used (Mr. Wales) with cold water circulating through it and a thermometer attached at ca. 1/16 of an inch. A number of determinations (about 12) gave on an average:

a. Temperature at which film ~~is~~ covers about 1/2 in. of the glass tube from the bottom: ca. 93°C. (200°F)

b. Temp. at which film covers entire length immersed in molten wax (viz. 1 1/2 in.) ca. 65°C. (150°F)

c. When stirring was employed, the temp. at which 1/2 in. from bottom was covered with a film was ca. 75°C. (167°F)

2. Metal apparatus employed, consisting of a ~~tube~~ brass tube (1/16 in. thick) with water circulating through it and a copper ring about an inch tall and made of 1/16 in. copper, fitting snugly around the brass tube. In this the conditions are very similar to those of the apparatus described in the patent; the cooling is, on account of smaller dimensions, probably more efficient.

With this apparatus, the temperature at a distance of ca. 1/16 in. from the copper ring was found to be ca. 120° C. (248° F.) when the first deposit was formed on copper ring. Above this temp. there was not a trace of deposit formed.

Cylinders for testing hardness by indentation with styles:

No. 20. Commercial brown wax, with mechanically reproduced round

Wax of Nos. 26—35 has been heated up to 200°C. before cooling, for the purpose of driving off any impurities that might be present.
Comp.: 65:35 (5 + Cu)

No. 21. Same as No. 20.
No. 22. Brown wax cast, when liquid, in gently warmed moulds and subjected to very slow cooling.
No. 23. Brown wax maintained in glycerin bath at 170°C. for ca. 10 minutes, then suddenly chilled from outside by plunging into ice-water.
No. 24. Polaris of brown wax made by Mr. Dodd in the ordinary way.
No. 25. Same as No. 24.

Experiment. Mixture 65 S + 35 Cu was filtered at 100°C. through Swedish filter-paper.

No. 26. S + Cu (65:35) cast warm, allowed to cool slowly; when perfectly solid, but somewhat warm, chilled out of mould with ice.

No. 27. S + Cu (65:35), cast at gentle warmth, allowed to cool slowly; when solid + quite cold, chilled out of mould with ice.

No. 28. Sudden chilling from about 60°C. water not very cold, when wax had cooled, chilled not with ice.

No. 29. Sudden chilling from about 60°C. Ice water.

No. 30 Sudden chilling from about 100°C. Ice water

No. 31. Sudden chilling from about 175°C. Ice water

No. 32. Sudden chilling from about 175°C. Ice water

No. 33. Slow chilling from about 100°C.

No. 34 Sudden chilling from melting point. Ice water.

No. 35 Sudden chilling with ice water from melting point.

No. 36. Regular white wax,
Suddenly chilled from about 175°C.

Hardness of Mixture of 65 5 + 35 Cer.
cast into blocks in different ways:
& tested with constant weight & -
Cone. The width of the groove,
approximately ~~[illegible]~~ estimated by in-
spection under the microscope, was
as follows:

1. Cyl. made by slow chilling,
average of 3 cylinds. . . . .0080 in.
2. " " sudden chilling from
60°C., average of 4 cyl. . . .0078 in.
3. " " by sudden chilling from 100°C. .0075 in.
4. " " " sudden " from 175°C
(average of 2 cyl.) . . .0078

Hardness of ordinary compositions:
1. Reg. white made by slow chilling . . .0060
2. " " " " " sudden chilling
from 175°C. 0060

3. Reg. Brown made commercially 0060

4. " " " by slow chilling .0060

5. " " " by chilling from 175°C .0080 (?)

Conclusion: Mixtures of stearic acid and cerosin are softer than ordinary waxes, and this hardness is not influenced by sudden chilling.

Brown commercial cylinder cast by process described in Macdonald patent. Was examined as to separation of ingredients (Cylinder No. 23):

Weight of Outside layer . . . . 1.0720g.

" " inside " 1.1805

No. of cc. of alcoholic KOH required to neutralize outside . . . . 5.15 cc.

Same — inside . . . . 5.50 cc.

1g. outside requires 4.80 cc.

1g. inside " 4.65

1g. commercial stearic acid requires 11.72 cc.

Outside contains 40.9% } Practically
Inside " 59.6% } the same.

Attempt to analyze a commercial cylinder made by the Columbia Graphite Company. — Nov. 1, 1903 —

Sample No. 1, weight . . . 10.0050
Every slight loss occurred at an early stage of the analysis.

Sample No. 2, weight . . . 10.00457
[illegible]

(1) Wt. of Pt. crucible + lid 50.4780
(2) Wt. of (1) + Al_2O_3 . . . . . 50.5205

Al_2O_3 .0425 g.
Al. 0.4284%

(3) Wt. of Pt. Cruc. + lid 50.4775

Coal

Pt. crucible 50.4775

+ sample (4935) 51.9300

sample . . 1.4525

Cruc. + res. (1st weighing) 50.7515

Res. (2nd ") 50.7515

.2740

(18.9%)

~~Porc. crucible + lid . . . 23.7650~~

~~+ sample (original) 25.5710~~

~~sample . . . 1.8030~~

R

Porc. cruc. . . . . 13.8110 -

- 200

+ sample . . . 15.3010 -

- 200

Sample 1.4900

+ res. (1st weighing) 14.1025 -

- 200

Res. .2915 (19.6%)

mean: 19.5%

+ res. (2nd weighing + tare) 14.1000 (19.5%)

[ITEM FOUND IN BOOK]

Green blue part fairly alter
part dull torn, rough
apparently not filled
seems as if gas formed a
uniform film
Record blue large,
Cracked –

D = Record very green
Lots of gold torn off mould
surface dull – does not seem
to be well filled – part of
a cavity shiny part dull
looks as if surface torn

[ITEM FOUND IN BOOK]

9 = part of Record –
Very blue – Crackled [illegible]
dull – very dull
[illegible]
[illegible]
very poor –

10 – Cracked – very bad
dull [illegible] appearance
very blue – gal) [illegible]
[illegible]
[illegible] very poor

[ITEM FOUND IN BOOK]

11 — Somewhat gold torn off
Surface rough not shiny
has torn appearance over
large part — Cracked
record —
Over entire record green
with blue tinge —

12 = Pharaoh gold torn from
mould on bottom and
Longitudinal scratches from
removing it from mould
Surface generally dull
pretty well filled
Record broken only part
given me — also a crack
in part given

[ITEM FOUND IN BOOK]

13 ~ Record broken —
only part given me; that
part cracked —
Some term pails, not —
not many shining grains
pretty well filled
Some pelvices show aerogen
Caught —

14 = Beef broth not broken
good term alignment slightly
little dirt at top end —
fields pretty weak — Microscopic
fair —

[ITEM FOUND IN BOOK]

15 — Only part of record remaining given me — Cracked in spots — bad surface — torn along, not filled in [illegible]

16 — Cylinder or dull surface green or [illegible] tinge — Some [illegible] shining other dull with torn appearance [illegible] gold torn off — Cylinder without but cracked —

[ITEM FOUND IN BOOK]

7 = Crystallized sing[illegible] generally or many be due to torn surface
Rough surface
Dont seem to be filled
Dull on one side brighter on
other side in places
Chipped - [illegible] chunk
to mold in places
Top pour mold very bad
surface - bottom better
fairly shining but surface
torn One inch from bottom
not shiny surface torn

Notebook, N-09-01-03

[ITEM FOUND IN BOOK]

Cable Address "Edison, New York"

From the Laboratory of

Thomas A. Edison.

Subject _____

Orange, N.J. 30 3 1909.

Jeff Gale Esq. = that I cannot judge of the merits of the case

M. Thomas A. Edison

Mr Ayrton tell you

Dear Sir

Herewith I beg to submit kind consideration a few preparations and the results so far obtained in the improvement of records masses.

From the first I ashtiled all possible means in order to impart to the mentain wax hardness of glass with sufficient toughness. Partly I succeeded by utilization of factes from linseed oil and dichloride of sulphur, the last experiments have given results which are 50% better than the popular records.

In order to avoid the disagreable Sulphur Dichloride I have taken for substitutes for the same and I found that I could get just as good factes by Trimethloride

The methods although giving good results are too complicated and extensive, and I have therefore looked for cheaper materials among which I found in the Gilsonite the proper thing.

After getting a small autoclave made by Mr. Ott I have treated many waxes and resins under pressure and found that Gilsonite by this treatement changes into easy melting material which mixes with many kind of waxes.

For itself it possesses a certain elasticity and if mixed

[ITEM FOUND IN BOOK]

[ON BACK OF PRECEDING PAGE]

with montan wax to about 50°, the quality of the records does not suffer in the least.

In order to consume the brittle nature of the Gilsonite, I have mixed with the same the Elaterite, treated in the same way. Elaterite when treated under pressures changes in such a substance which is absolutely soluble in Benzine and mixes with montan wax in all proportions.

If added in the proportions of 50°, records are obtained which are 20° better than the regular.

From the samples sent you will recognize that Elaterite for itself is too soft, and I have therefore mixed the same with changed Gilsonite, obtaining just as good results.

The crudeness of the materials and the simplicity of the process used by me, is clear sticking enough to ask you for your kind opinion, in the ~~memoirs as Mr. Clyde worth~~ is absent and I cannot therefore obtain any information from him.

Awaiting your further commands, I leave the honor to remain, Sir,

Your very obedient Servant

Ignacy Goldstein

chemist.

Notebook, N-10-07-29

July 27 1910

Experiment on tetranaphthalene + Shellac find a chemical to keep the shellac from decomposing

1/2 Tetrachloronaphthalene
1/2 Shellac -
Melt Tetra then add the shellac in small lots stirring all the time until all in —

Then add 1/5 more of X — and keep it at a temperature where it is about as liquid as it was before X added

See how long it takes before it goes to a jelly

	Shellac grams	Gum grams	Solvent	Name of solvent
1	5	5	2	salicylic acid.
2	5	5	"	analine
3	5	5	2	Phenol
4	5	5	2	Ortho Ether analine
5	5	5	2	Creasote
6	5	5	2	Toluene
7	5	5	2	Naphthalene Bichromate
8	5	5	2	" alpha mono nitro
9	5	5	2	Xylidine
10	5	5	2	Creosol
1	5	5	2	Palmitic Olein + Stearin acid
2	5	5	2	Tin wax from Shellac
3	5	5	2	Shellac free from wax
4	5	5	2	" free Stearin acid
5	5	5	2	Olein acid
6	5	5	2	Pure Shellac + Common Shellac
7	5	5	2	Palmitic acid
8	5	5	2	Stearin acid
9	5	5	2	anisol
20	5	5	2	Cumole
1	5	5	2	Ethylene Chloride
2	5	5	2	Caproic acid
3	5	5	2	acetal
4	5	5	2	amylidine Butyrate
5	5	5	2	Leather Tannin
6	5	5	2	" anthracene

Number	Grams	Soft	Hard	Brittle	Tough	Remarks
1	110	m	m	"		To much solvent
2	110		m	"		" " "
	110			"		
6	110		m	"	ok	looks good
3	110		m	"		~~Dry~~ ng
1½	110		m	s		Flame excess
2	110		v	"	ok	
2½	110			"		" " "
9	115	"		"		to soft
10	115		v	"		looks good
7	112				ng	
1¼	115		m	"	ok	excess of nap
1¼	108		m	"	ok	excess of nap
1	110	"		"	ng	dark. ng
2	110					
2	110		"	"	ok	looks good
2	110	"		"		Rubbery
2	110		m	"		Waxy
2½	110		m	"	ng	same as 1a
1	110	"		"		
1	110	"		"		hard
1	110	"		"		
1	110	"		"	ng	
1	110					thin hard
1	110					thin very hard
1	110					"

		Remarks	Pro Run
27	Camphor	thin	
28	Mono Chloro Phenole	" soft Rubbery	3
29	Methyl oxid Benzoin	" very hard waxy	1
30	Cellon Benzoin	" " " "	1
31	Carbon Bichloride	gas Comes out	
32	Phenyl Hydrozine	" " " Ng	
3	Benzaldehyde	very hard waxy	120
4	Anisol	to soft Ng	230.
5	amyl Butyrate	very hard tough	130
6	Oil of Cedar	soft Rubbery	0.30
7	est Resin Jalapa	very hard Brittle	.20
8	Picric acid	" Brittle	1.05
9	est Kalmia flo.	Resin that Coagulates thin Melts.	1½
40	Acid Carbonatin Com	soft No good.	2
1	Fusil Oil, Pure.	very hard	1
2	Urea Carbamid	Coagulates the shellac	Ng.
3	Benzoic acid	looks good very thin to soft	3.10
4	est guiacum	very hard " good	2.10
5	3rd fraction from distillation of Anthracene	" " " Brittle	1.20
6	Iron Resinate	goes in it brittle by it	1.20
7	Urea Chloroestone	soft No good	1
8	" Cresotinic	hard, tough "	1
9	Potassium Bichromate	Thick hard waxy	1
50	Creosote Oil	thin " "	1
1	Ozokerite	Dont mix good Hard	1.10
2	Naphthalamine alpha	looks good "	
3	Yellow Ozokerite	Dont mix	1
4	Ichthyol	hard	1.20

asphalt
Nitro Benzole
Cumarin acid
Benzyl Chloride
Pitch
sodium Silicate
sealing wax
anthracene
Lead Resinate
Barium "
Magnesium "

hard Don't mix well	two
" same as Shellac	130
hard No good	1
" as Shellac	30
" " "	1
Don't Mix good soft	2
very hard Rich.	0.30
" "	.25
	.45

2
1

	Lead Chloride	Solvent	
1	"	Nitro Analine	"
2	"	Naphthol alpha	"
3	"	Phenanthren	"
4	"	Resorcine	~~Mix~~
5	"	Acetanilide	—
6	"	Benzidine	Mix
7	"	Methyl Phenylen amine	
8	"	Ethyl Acetoluidine	—
9	"	Diamsidine	~~Solvent~~
10	"	Phenol Tri Bromide	Mix
1	"	Trichloro Phenol	—
2	"	Benzo Phenol	—
3	"	Nitro Cresol	—
4	"	Phenylen diamine	Mix
5	"	Basic Hydrogenium	—
6	"	Naphthalene Bichromate	—
7	"	Nitro Phenol	Mix
8	"	Amido Phenol	"
9	"	Nitro Cresol	—
20	"	Sebacic acid	Mix
1	"	Ortho Nitro Para Phenetidine	Paste
2		Para Dichloro Nitro Benzol	—
3		Ortho Nitro Phenol	—
4		Dimethyl Diamido azobenzol	—
5		Toluene	Mark
6		Dichlor analine	—
7		Para Nitro acetanilide	Mix

	substance	Solvent	Mixture	Soluble
28	Sod Chloride	Orthotoluide sulphonamide		
9	"	Azobenzol	No good	
30	"	Amylo Phenol	"	
1	"	Anthracene	No good	
2	"	Benzamide	"	" ok
3	"	Ortho Nitro Para toluol	No good	
4	"	Para Nitro Chloro Benzol	No good	
5	"	Diphenylamine	No good	
6	"	Trichloro Quinone	No good	
7	"	Carbazol	" "	
8	"	Hexachloroethane	" "	
9	"	Intramolecular azobenzole	" "	
40	"	Mono alpha Nitro Naphthalin	"	
1	"	Azobenzole	"	
2	"	Phthalimamine ok	soluble	ok
3	"	Para nitro Chloro Benzol	"	
4	"	Nitroquinolin ortho	"	
5	"	Trichloro Phenol	"	
6	"	Dibenzo Phenyl	No good	
7	"	Dimethylamino azobenzene	" "	
8	"	Perchloro benzol	" "	
9	"	Heliotropine	"	
50	"	Phenanthrene	"	
1	"	Dinitro Phenol	"	
2	"	Benzo Phenone	No good	
3	"	Nitro Nitrol	"	
4	"	Chrysoidine acid	"	
5	"	Dioxynaphthalene	No good	

		Soft	Hard	Mix	Sol	No good
56	alpha Naptha		—	—		
7	Benzanilid		—	—		
8	Nitro analin Meta		—	—		
9	Phenylendiamine		—	—		
60	anthra quinone		—	—		
1	Monobromated Camphor		—	—		
2	Phenacetine		—	—	—	
3	Para amido ortho cresol		—	—	—	
4	Ortho amido Phenol		—	—		
5	Nitro Phenol Para					—
6	Para dichloro analine					—
7	Quercitrin					—
8	Para anisidine					—
9	Mono Methyl Para amido Phenol					—
70	Tetra Chlor quinone					—
1	Binitro toluole	Give try it OK				
2	Ortho toluidine					—
3	Nitro Benzoic acid					—
4	amido azo benzine					—
5	amido Phenol Ortho					—
6	" " Para		Hard Mix			
7	Toluendiamine com.					—
8	Para Nitro cresol			Soluble		
9	Cinchonidine Benzoate			"		
80	amido azo benzole					—
1	alpha Mono Nitro Napthalin					—
2	Tetra Methyl di amido di phenyl Methane		Hard mix			
3	Toluendiamine Meta Com					

		Mixed	Mix	Sol	No good
84	Volumdiamine Meta Com				
5	Picric acid				
6	Benzo Naphthalen				
7	Benzidine				
8	" Base				
9	Hydro quinone				
90	Monomethyl Naphthylamine amino				
1	Meta toluen diamine				
2	Phenolin acid				
3	Benz phenol				
4	Hydro azobenzole				
5	Eosin				
6	Methylene blue				
7	Acetic Para phenylendiamine			Oil	Soluble fine
8	Hydrometer				
9	Chloro Nitro Benzole Para			Mixed	mix
10	Di nitro Benzole			Bine	Oil Very
1	Phen Triamine				No good
2	Ciamidine carbonate				
3	Ortho nitro Benzaldehyde				
4	" Chloro Benzole				
5	Acetic Para amido Phenol				
6					
7					
8					
9					
10					
1					

The Beets try it Oil fine

Solvent Br.
Lead Chloride $PbCl_2$
Ortho amido Phenol
Anthraphenyl diamine base
Carbo toluidine base
Amido-azobenzole
Nitro aniline Para base
Acetic Paraamido-Phenole
Thiocinnamin base
Dianisidine

Exps Ardsworth's Resin
+ Chloride of Lead.

Resin	Chloride	
2 1/2	1	fair
"	2	better
"	3	better still
"	4	better than 3 &c
3	5	best
"	6	to thick
"	+ Paramido PB Cl	best yet
" 3		
"		

~~" to [illegible] proportion~~

10 of PB Cl2 to 6 of Resin is the best proportion; more Chloride makes it tougher but too thick. Exp to make it thinner by solvents for the PB Cl2

Resin	Chloride	
2 1/2	+ 6/10 ~~Chloroform~~	No good
2 1/2	+ 1 of Phoeinnamine + 6 Chloroform	No good

10 PBCh. G. Russian

1 gram of Astrachan
makes 10 to 20 ~~[illegible]~~ Reversible
better than 2 to 1 in that
Russian
don't have the antanbul
in.

Japan wants Shellac now

aug 25 1900

gave to Petit to put on
some forms
Resin asphalt. PB Cl2
108 gm 180

found that Phenol
is the proper volatile solvent
to use for preventing the Resin
from becoming thick and
the thickening is due too (the)
evaporation of the phenol
in the Resin by more
10-6 and maybe more
Chloride thinning it with
phenol very fair Records
Maple sir it heating makes
it hard and tough

Experiments
J.W.O.

PbCl2 grams	Resin grams	Phenol grams
1	5	
2	5	
3	5	
4	5	
5	5	
6	5	
7	5	
8	5	
9	5	
10	5	
11	5	
12	5	
13	5	
14	5	
15	5	
16	5	
17	5	
18	5	
19	5	
20	5	
21	5	
22	5	
23	5	
24	5	
25	5	

Inquiries

best Solvents ~~CS_2~~ CCl_4

1 acetylene tetra chloride
2 Phenol
3 Dichlorobenzol
4 Isobutyl Xylol
5 Nitro Xylol Para
6 " " Meta
7 Monochloro toluol
8 Pergolacetylene
9 Methyl ethyl Ketone
10 iodine
11 Monomethyl aniline
12 Xylol ortho Com
13 Xylidine meta
14 " ortho
15 " para
16 Nitrotoluol ortho
17 Methyl Benzamide
18 Oxy Phenylidine
19 Dichlorohydrine alpha
20 Xylidine para
21
22 ~~second best~~
23 Monochlorohydrine
24 Cresol
25 Monoethyl Para toluidine
26 Iso Chloranilin
27 Nitro Phenol ortho

No good for solvent

28. Eugenol iso
29 Creosote
30 Pinchforethan
31. Para Phenetidine
32 Monethyl toluidine
33 Methylal
34 amyl alcohol
35 aniline
36 Hydrogen
37 Nitro toluol
38 Mono-Ethyl Naphthalene
39 Dimethyl aniline
40 Methyl aniline
41 Toluene Mylar
42 Methyl 20 Ephthylamine

Experiments to Treat Gum
the Resin by
boiling with a Solvent to
displace the Phenol.

Solvents	Remarks.
~~Nitro Benzol~~ & Xylene	
Nitro Xylol	
Monochloro benzole	
Isobutyl Xylol	
Nitro Nitrol Ortho Com.	

It seems that J N O
the Old man was working
on a Bakelite that is made
with a volatile solvent
that takes the place of
phenol in the CH_2O
Reaction. Therefore
the gum must be fitter
on this evaporate the solvent
make a plastic dope
then press the record and
everything is tough as
hell.

Notebook, N-10-11-19

all flown at 10:00 speed up to
no 34

Reg Mix 37½ shellac
12½ tetra
15 asbestos ... through 60 mesh
No-1 heat mix to 284 F mold 280 F
asbestos warmed in oven before mixing
weight of Record 39 g speed 1500

No 2 Dup of no 1 except mix heat to 311
No 3 " " " 300
weight of Record 44.5
No-4 Dup of no 3 - Weight of Record 49 g

No-5 Mix for end rings 112½ shellac
speed 1500 37½ tetra (300 F)
45 asbestos

Poured at 300 mold 290
Stuck in mold -

No-6 Had mold Nickel plated
Mix for end rings 112½ shellac
speed 1500 37½ tetra (300 F)
45 asbestos

Weight of Blank for end rings 110.5
for small end

No 7 mix for large end rings 86½ shellac
speed 1500 18¾ tetra
Asbestos not screened 22½ asbestos
(300 F)
Weight of Blank for end rings 144.5
for large end

Weight of small end ring ~~[illegible]~~ 110 g
orig size 2 1/32 - 1/16 Guide

Time for pressing rings in mold
65 sec Ring 55 sec

Ring oven 210 F

Ring mold 280 F

No 8 temp. for Mold 293. Min 300
No 9 " " 300 " 310
No-10 Sup of No 9 except new Mold to try and see if the record will extract without pulling

No 9 1/2 37.5 Shellac 12.5 tetra 15 asbestos
2.5 Dichlorobydrine Alpha expd 1500
Hard to extract from Mold
Mold 300 Min 300

No-10 Sup of 9 Except Mold 280 Min 280

Reamed to hot

~~No 11 Sup of 10~~

No - 11 Expt for contraction
Shellac 45g tetra 15g - 4cc trichloroethylene
alpha - 20 asbestos 60 mesh - Let lay on ice 14 hrs all night
could not extract it on cracked ice + salt
1 hr came out of mold hard
mold 280 min 280

Cold test on Records
1 2 Records with straight 3/32 taper paper cores - marked 1 + 2

A B Records with 3/32 straight paper cores with paper rings in ends - marked A + B

1 - 2 - A + B were put on ice test and did not show any cracks at 4° below zero. Then they were put in Carbonic Acid test
#1 cracked after 30 min at -40 below zero
" 2 " " "
" A did not crack at 40 below
" B " "

Same Records on hot test at 110° F - 2 that layed down flattened the two that stood up warped out of shape - the mix was
37½ shellac - 12½ tetra - 15 asbestos. Reg
mix 6 280F mix 270 F

No. 1 ~~Cup for Contraction~~

~~Shellac [illegible] Ether [illegible] Castor oil 15~~

Dichlorohydrin alpha 75 cc

Revolved [illegible] did not contract

~~enough [illegible] creation [illegible] 5 min~~

~~Stick [illegible] mold~~ 500° Min 500

No. 13 ~~for contraction~~

~~Shellac [illegible] Ether [illegible] Castor oil 15~~

~~Dichlorohydrin alpha 75 cc~~

#12 Experiment for contraction
Shellac 37.5g. Tetra 12.5g. dry Asbestos 60 mesh 15g
Dichlorohydrine Alpha 1½ CC worked on
for 5 minutes did not contract enough to
come out then put in cracked ice +
salt 5 minutes still stuck fast could
not pull it out took mold and hit
it on end and forced it and then it
came out but to close did not shrink
enough dragged on side of mold
Temperature of mold 300F mix 300 F

#13 experiment for Contraction
Shellac 37.5g Tetra 12.5g dry Asbestos 60 mesh 15g
Dichlorohydrine Alpha 2½ CC
put mold on for 5 minutes then took
mold and forced it on end and then it
came out but not shrink enough cylinder
dragged on side of mold
Temperature of mold 300F + mix 300 F

#14 exp for contraction 60 mesh
Shellac 37.5g Tetra 12.5g dry Asbestos 15g
Temperature of mobile 300F Mix 300F
Put on Ice 5 minutes then forced mobile on end
and it came out but end of record stuck to
end of mobile.

#15 Exp for Contraction
60 mesh
Shellac 42.5g Tetra 7.5g dryed Asbestos 15g
Temperature of mobile 280F Mix 300F
Put on Ice 5 minutes came out same
Carried them # 14

Potash 15 shellac tetra 4 asbestos 12

Potash shellac 15 tetra 5 asbestos 12 chalk 15

Disk

16

60 mesh

Shellac 156 g Tetra 50 g asbestos 60 g

Poured out on glass

Disk

#17

60 mesh

Shellac 120 tetra 32 asbestos 96

Disk

#18

60 mesh

Shellac 90 tetra 30 asbestos 72

chalk 90 - could only get 45 of the chalk in then it was so stiff I had to take it out of pan with a spatabular and press it down with flat peice of glass

15 shellac 3 Tetra 10 asbestos

shellac 15 Tetra 5

J.W.A. Resin 37.5 Tetra 12.5 Asbestos 15

Lick

#19 60 mesh

shellac 120 Tetra 24 Asbestos 80

Lick

#20

shellac 135 Tetra 45

Lick

#21 60 mesh

J.W.A. Resin 150 Tetra 50 Asbestos 60

shellac 37.5 Tetra 12.5 asbestos 15
flour of sulphur 10%

"Disk

#12

shellac 150g Tetra 50g 60 mesh Asbestos 60g
flour of sulphur 26g

Through 60 mesh

#23 - Shellac 45g Tetra 12g Asbestos 36
Bintrotulol - Mold 300 Mix 310
on ice 5 min - had to pour it to get it out

Through 60 mesh

#24 - Shellac 45g Tetra 9.g Asbestos 36
Bintrotulol 6g - Mold 300 Mix 310
on ice 5 min - had to pour and pull
to get it out

Through 60 mesh

#25 - Shellac 45 Tetra 12 Asbestos 36g
Paraformaldehyed 3-cc. Mold 300
Mix 310 on ice 5 min had to par them
pull to get it out

Through 60 mesh

No 26 - Shellac 45g Tetra 9 Asbestos 36
Paraformaldehyed 6cc - Mold 300 - Mix 310
Could only get 1/2 Record the Paraformaldehyed
made it swell up so it cant be poured
had to par mold to get record out

NG #27 - Shellac 45g tetra 12g Through 60 mesh Asbestos 36g
Diaminidin Base 5g thick wont flow
" makes it condense

NG #28 - Shellac 45g tetra 9g Through 60 mesh Asbestos 36g
Diaminidin 6g N.G.

60 mesh

#29 Shellac 45g tetra 12g Asbestos 36g
Nitroanisol Para 3g Mold 300 Mint 310
had to pur it to get it out
on ice 5 min

Through 60 mesh

#30 Shellac 45g tetra 12g Asbestos 36g
Nitroanisol Para 6g. Mold 300 Mint 310
on ice 5 min had to pur it hard pulling
to get it out record is quite soft

#31 Jawa. Resin

Resin 56.25g Tetra 18.75g Asbestos 22.5 60 mesh
Mold: 300°F Mix 320F pulled out hard

#32
Jawa Resin
Resin 56,25g Tetra 18.75g Asbestos 45g
Mold: 300°F Mix 320F pulled out hard

#33
Juvo Resin
Resin 5625g Jetra 18,750g Arbutin 5625g
Mold 300 Mix 330 pulled out hard

34- Dup of 33 except Mold 310
mix 350 on ice 5 min pulled out
hard

#35 - 37½ Shellac 12½ tetra 15 tisbrestes
Speed of Lathe increased from 1500
revolutions to 1800
on ice 5 min came out easier than
any so far temperature of Mold 230 F
Mix 310 F

#36 Dup of 35 - dropped out after
slightly faring
temperature of Mold 230 F Mix 310 F

Speed 1800

37- Dup of 35- tried to press mold with finger on one side to see if the shrinkage could be felt then turned mold up and Record dropped out temperature of molds 230 F Mix 310 F speed 1600

38 Dup of 35 except after scanning put on Vacuum did not come out. had to put on Ice then came out fair
temperature of molds 230 F Mix 310 F
Vacuum Collapsed the record
speed 1600

39 Deep of 35 except put on vacuum
when just warm did not come out
put on 2cc came out fair
temperature of molds 230 F mix 310 F
Speed 1800

40 Deep of 35 except put in cold
jacket until cold then put on vacuum
did not come out put on 2cc 5 minutes
came out fair
temperature of molds 230 F mix 310 F
Speed 1800

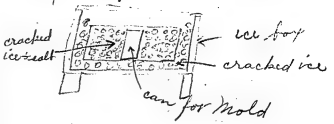
41 Dupe of 35 except after four minutes
put on vacuum did not come out forced molds
hard on end then came out slightly collapsed
temperature of molds 230 F mix 310 F
speed 1500

42 Dupe of 35 except after 2½ minutes
put on vacuum did not come out put on
ice for 5 minutes then came out fair
temperature of molds 230 F mix 310 F
speed 1600

43 Dup of 35 except after one minute put on vacuum to soft collapsed on one end
temperature of mold 230 mix 310 F
Speed 1500

44 Dup of 35 except made in regular way mold 230 F mix 310 F put on for 5 minutes and it dropped out mix stuck to cap of mold
temperature mold 230 F mix 310 F
Speed 1600

#45. Took regular mix + regular way of spinning Record put mold in can that was packed in salt and cracked ice after 5 min. took mold of of can record still remained in mold tried it again at 15 min. still stuck in mold then let it go 40 min. Then picked out mold and record remained in can - droped out of mold — Speed 1800



46 Trip of 45 Except cooled on ice 5 min then in the can for 5 min. in taking the mold out it was slightly pared and record droped out
Speed 1800

#47

Drop of 45° Except 4 min. on ice 5 min in can a very slight pare and it droped out. in the following experiments a peice of copper is put between can and mold to conduct the cold to the mold

Speed 1800

#48 Drop of 45° Except 8 min on ice 5 min in can a very slight pare and out it droped

Speed 1600

#49 Sup of 45 Except 2 min on ice
5 min in can - a slight jare and it
droped out Spend 1800

#50 Sup of 45 Except 1 min on ice 5 min in
can droped out by slightly jarring
Spend 1800

#51 Drop of 45 Except 1/2 min on ice 5 min in can slight pore - OK Speed 1600

52 Drop of 51 - OK Speed 1800

#53 Bef of 45 except 15 min. in can did not come out free speed 1500

#54 Bef of 45 except 1/2 min on ice and 4 min in can did not shrink enough - speed 1800

#55 – Drop of 45 Except 1 min on ice 4 min in can slight jar dropped out OK – Spent 1500

56 Drop of 45 Except 1 min on ice 3 min in can slight jar dropped out OK – Spent 1000

#57. Dup of 45 Except 1min on ice 2min in can slight gas dropped out OK - opened 1800

58 Dup of 45 Except 1min on ice 1min in can slight gas dropped out OK - opened 1800

#59 - Reg. shellac mix - shellac 37½ g tetra 12½
Asbestos 15. Mix run in mold ~~[illegible]~~
mold revolved 2 min the 50 g regular
record wax run in for a backing
then mold put on ice for 1½ min
then can 2 min dropped out with
a slight jarr - speed 1000

60 Dup of 59 Except 25% Asbestos added to
to the Record wax. both inner and outer
walls cracked shellac had not flowed
the full length of mold - mold not
hot enough - the amt. of shellac mix used
in the record was ⅔ of what was used
in No 59
Most of the Asbestos settles ~~[illegible]~~ out
of wax - speed 1800

#61 Dup of 60 Except 10% asbestos - shellac and Record wax cracked - speed 1800.

#62 Dup of 60 Except 100% asbestos - shellac and record wax cracked - speed 1500

#63. Dup of 59 Except 3/5 the amt of Big shellac mix used - record wax cracked
75 g Record wax at 220° F - speed 1500

64 Dup of 63 Except 60 g Record wax not enough wax was slightly shrunk away shellac on cooling - speed 1500

#65 Shellac 25g tetra 8/3g Asbestos 10g Pigments
70g Record wax with 5% chalk mold
was not hot enough to allow the shellac to
run the full length of mold left out
on window sill 1hr dropped out not
cracked - Dipped 1800

#66 Shellac 25g tetra 8/3g asbestos 10g spun
for 2 min then 70g record wax with 5%
chalk run in then reamed to right size
then cooled on window sill 10 min temp 40°
then in can 2½ min dropped out
Record wax slightly contracted from shellac mix
Dipped 1800

Record wax 220

#67 shellac 25 - tetra 8/3 asbestos 10 spum 2 min
then 75g record wax with 10% chalk run in
then reamed to right size then cooled on ice
untill the record wax fills cool inside the
mold cracked on ice - Speed 1800

#68 Dup of 67. Except 15% chalk in Record
wax come out easily by cooling on
ice did not crack - Speed 1800

½ Dry cup of Drip

#69 shellac 18¾ tetra 6¼ Asbestos 7½
come out on ice OK — opened 1500
Backed with reamed wax + 15% chalk

cold test
wax cracked at 30°F
Shellac " 40 F or 40 C
taken out — room

#70 Shellac 18¾ tetra 6¼ Asbestos 7½
Backed with reamed wax 20% chalk — wax poured 1 min after shellac mix had been poured, reamed and allowed to cool before putting on ice on ice 1½ min come out OK
did not have a good surface possable poured wax to quick — opened 1500

No-71 Sup of 70 Except poured record was 1/2 min after pouring shellac - mix - ap wed 1500 came out OK on ice allowed it to cool before putting on ice
70 g record was not enough in
Cold Test
was cracked at
Shellac OK at 56°F or 49°C
in 1 hr

#72 Sup of No 71 Except used 150 g mud was reamed out 37 g record was - ap wed 1500
came out OK

40% of the original wt

#73 Exp of 71 Except chalk come out OK on ice speed 1800

Cold test

30 min { Put in hot at 58°F or 50°C
reading every ten min 37 C or 34.6 F
" " " 48 C 54.2 "
" " " 55 67. "
OK after 30 min no cracks

#74 Shellac 15 g tetra 5 Asbestos 6 g backed with wood was with 25% chalk
Shellac mix did not run the full length of mold - Lathe was set level - speed 1800 on ice out OK

Remarks

75 ~~Dup~~ of 74 except poured at 2.00 and 2 min after the shellac had been poured funnel for shellac mix not held so far in mold while being poured - used 1800 not enough shellac mix to fill mold

76 Dup of 75

No. 77 - Shellac 18¾ tetra 6¼ Asbestos 7½
Asbestos had been run through rolls
8 times rolls was set at .006 fine ground
Shellac mix 310° - record wax with 25%
Asbestos 220° - speed 1800
[illegible] cooled in the open air dropped out
OK funnel not cleaned from the
reg. mix

No 78 - Dup. of 77 Exp. funnel cleaned

#79 Shellac 16 ~~[illegible]~~ gilsonite 6½ asbestos 7½
record wax with 35% Chalk - spud 1800
come out OK in cold air
cold test
wax cracked
Shellac OK at -48°C or 54.2 F
after 1½ hr

#80 Dup of 79. Except 35% Chalk in
Record wax
cold test
Put in temp 60°C or 76 F
for 30 min did not crack

Hot surface

81 Mallac 18 1/2 tetra 6 1/2 Asbestos 7 1/2
Mold 335 mix 310 spind 1500

82 drop of 73

Cold test
In ice box 10 min then in CO_2 1/2 hr
In at 68.8°F
out " 76.
slightly cracked when taken out

~~Cold Test~~
~~# 69 - was cracked at 30°F~~
~~Shellac " 40°F~~

83 Drop of 73
Cold test
In ice bath 10 min then in CO_2 ½ hr
Put in CO_2 at 76°F
out " at 58°F
slightly cracked

"84 Dup of 73 Except sifted

Cold test

In ice bot 10 min then in CO_2 ½ hr
Put in CO_2 at 58.° F
Out " " 56° F
Did not crack

85 Dup of 84"

Cold test

In ice bot 10 min then in CO_2 ½ hr
Put in CO_2 at 58.° F
Out " " 56.2° F
Did not crack

86 shellac 18 3/4 Extra 6 1/4 asbestos 7 1/2
mold 335 mix 310 Resod wax ± 5 cloth
280 Had to pare mold to get it out
stuck Block wax shrunk away from
shellac - spend 1800

87 shellac 18 3/4 Extra 6 1/2 asbestos 7 1/2
mold 335 mix 310 Block wax ± 20
shrank away from shellac had to get out
of mold - spend 1800

88 Dup of 86 except speed 900 instead of 1800
come out easily but surface bad
Block wax shrunk away from shellac

89 Shellac 18 3/4 tetra 6 1/4 antutex 9 1/2
mold 340 wax 280 shellac mix 310
speed 1800 stuck fast in mold had to dissolve some of it out
record wax had 40% chalk - wax shrunk away from shellac

#90 Shellac 18 3/4 tetra 6 1/4 Asbestos 7 1/2
Mold 300 Shellac min 310 wax 220 with
25% chalk speed 2100 had to put it in
with [illegible]
can to get it out of mold wax shrunk
away from shellac surface bad.

91 Shellac 18 3/4 tetra 6 1/4 Asbestos 7 1/2
mold 300 min 310 wax ± 20 with 25% chalk
wax was poured immeadiatly after pouring
shellac speed 1600

#92 Dup of 91 Graft 30% chalk in Black wax

#93 Pegu shellac ~~[illegible]~~ poured very slowly for surface not good did not run the full length of mold

#94 Dup of 93 Except poured twice as fast
not a good surface

#95 Dup of 93 Except poured three times as fast
surface sag

#96 Shellac 2 2/2 7 1/2 tetra 3/4 zinc stearate
Cabcitos 11 for surface - pink

#97 Dup of 96 Except 1½g zinc sterate
surface punk

#98 Shellac 18¾ tetra 6¼ Asbestos 7½
naphtylamine 1g poured at 290
surface NG

#99 Dup of 98 Except 1g Benz Phenol
surface NG mint 290 mold 300

#100 Dup of 98 Except 1g Dimethylanidoazo-
benzol purified. mold 300 mint 300
Surface NG

#101- Dup of 98 Except 1g Dichlor anilin Cond
Mold 300 mix 300 surface not very good
some improvement

#102 Dup of 98 Except 1g Phenanthren cp
Mold 300 mix 300 surface NG

#103 Dup of 98 Except 1g Ortho tolul-sulphamido- surface little improvement mold 200 mix 300

#104 Dup of 98 Except 1g Acet para Phenyl-endiamine mold 800 mix 300 Contains air surface

105 Shellac 18¾g Tetra 6¼g Asbestos 7½g
Nitrobenzol 1.C.C. speed 1750
surface N.G. softer compound

106 Shellac 18¾g Tetra 6¼g Asbestos 7½g
Speed 2400 did not take the air out
Surface N.G.
Temperature of molds 300 F. Mix 310 F.

Asbestos 1/4 short

#107 Shellac 37 1/2 tetra 1 1/2 Asbestos 11 1/4
mold 300 mix 310. Spud 1800
Surface not good

Asbestos 1/2 out

#108 Dup of 107 Except 7 1/2 Asbestos
surface punk

Asbestos 3/4 out

#109- Dup of 107 Except 3 1/2 g asbestos
Surface N.G.

100 Dup of 107 Exept no asbestos
Surface N.G.

#111 Shellac 37.5 tetra 12½ Asbestos 15.
Asbestos put in tetra before shellac
Bad surface Speed 1800

#112 Sup of 111 Sup 7½ Asbestos
Bad surface

113 Shellac 37½ g Tetra 12½ g no Asbestos
Melted very easily and poured at 250 F.
Mold 300 F put funnel in oven to
get same temperature as mold
surface fair

114 shellac 37½ g Tetra 12½ g Asbestos 15 g
Mix 310 F mold 300 F funnel warmed in oven
surface not very good

115 shellac 37½ g Tetra 12½ g Asbestos 15 g
Mix 250 F Mold 300 F funnel warmed in
oven Mix to thick did not pour well
surface N.G.

#116 shellac 37½g Tetra 12½g Asbestos 7½g
Mix 310°F Mold 300°F fuel warmed in oven
surface N.G.

#117 Shellac 37.5g Tetra 12.5g Asbestos 7.5g
Mix 250°F Mold 300°F fuel warmed in oven
Mix to thick did not pour well
surface not good

#118 Shellac 37.5g Tetra 12.5g Asbestos 15g
melted tetra then put in asbestos fuel warmed in oven
Mix 310°F Mold 300°F
surface not good

119 shellac 37.5g Vetrin 12.5g Asbestos 15g
Mix 310°F Molds 300°F warmed funel in oven
poured it from one end did not flow to
end of molds surface not good

120 shellac 37.5g Vetrin 12.5g Asbestos 15g
Mix 330°F Molds 300°F funel warmed in oven
stuck to molds

121 shellac 37.5 Vetrin 12.5g Asbestos 15g
Mix 320°F Molds 300°F funel warmed in oven
stuck slightly to molds

#122, 123 + 124 Cy for running true

#125, 126, 127 + 128 Cy. for Blow holes

#129 Shellac 18% tetra 6% no acetate
Cp for plaging surface

130

Regular 4 minute sieved wax blank — weight 73 g
Coated with shellac & Tetra Zinc — " 18 g shellac
15 g shellac
5.5 g Tetra
1/2 g oleate Zinc

131

Reg 4 min sieved wax 20% Chalk — weight 81.5 g
Coated with shellac & Tetra Zinc — " 18 g shellac
18 g shellac
5.5 g Tetra
1/2 g oleate Zinc

132

Reg 4 min second wax 40% Chalk — weight 86. g.
Coated with shellac & Istra Zing — " 18g shellac
15g shellac
5.5g Istra
½ Stearate Zing

133

Reg 4 min second wax 18% Infusorial earth Zic — weight 76 g.
Coated with shellac & Istra Zing — " 18g shellac
15g shellac
5.5g Istra
½ g Stearate Zing

#134.

Reg 4 min second wax 7% Infusorial earth too — weight 73 g
Coated with shellac + Istra Zing — " 18g shellac
15g shellac
5.5g Istra
1½ g Stearate Zing

#135.

Reg 4 min second wax 40% Talcum powder — weight 89.5 g
Coated with shellac + Istra Zing — " 18g shellac
15g Shellac
5.5g Istra
1½ g Stearate Zing

136

Reg 4 min second wax 20% Datum powder weight 81.25 g
Coated with shellac + Titra Zing " 18 g shellac
15 g Shellac
5.5 g Titra
12 g Alternate Zing

137

Reg 4 min second wax blank weight 73 g
Coated with shellac titra + asbestos " 18 g shellac
37.5 g Shellac
12.5 g Titra
15 g Asbestos screened through 60 mesh

H 138

Rig 4 min record wax 20% Chalk — weight 81.5 g
Coated with shellac Iteu + asbestos — " 18 g shellac
37.5 g Shellac
12.5 g Iteu
15 g Asbestos through 60 mesh

H 139

Rig 4 min record wax 40% Chalk — weight 86 g
Coated with shellac Iteu + asbestos — " 18 g Shellac
37.5 g Shellac
12.5 g Iteu
15 g Asbestos through 60 mesh

#140

Reg 4 min record wax 15% Infusorial earth tie weight 75 g
Cooled with shellac fibra + asbestos 1/2 Reg shellac
37.5 g Shellac
12.5 g Fibra
15 g Asbestos through 60 mesh

#141 all cracked

Reg 4 min record wax 7% Infusorial earth tie weight 75 g
Cooled with shellac fibra + asbestos
37.5 g Shellac
12.5 g Fibra
15 g Asbestos through 60 mesh

#142

Reg 1 min accord wax 40% Talcum powder weight 87.5 g
Coated with shellac titra asbestos " 13 g shellac
37.5 g Shellac
12.5 g Titra
13 g Asbestos through 60 mesh.

#143 all spoiled in putting on shellac

Reg 1 min accord wax 20% Talcum powder weight 81.25 "
Coated with shellac titra + Asbestos
37.5 Shellac
12.5 g Titra
13 g Asbestos through 60 mesh.

#144 second spin skin
Rec 4 min wax put in molds and pressured to 1800 lbs
& Vacuum inch

#145
Duplicate of #144

56 - (4446 / 446 (4-

8 to lb water
12 to lb chalk
34 to lb tow 150 lb

34) 4446 (12
34
96
96

13) 4446 (34-
39
57
57

12 -
7
60
4/10
11

106) 4446 (42.
424.0
7

.15

97
36
3

97.00
36
36

446
1
56

8

#145 - 146 - 147 - 148 - 149 + 150 Shellac 37½g
12½g tetra 15g Asbestos 1.25g zinc
stearate (4 mins Record was had 40% Chalk)
weight of Blank before coating with shellac

Before Coating					
145 -	91.8g	after coating	106.5	dif.	14.7g
146 -	93.5g	"	106.5	"	12.7g
147 -	93.7g	"	107.1	"	13.4g
148 -	91.5g	"	103.2	"	11.9g
149 -	93.3g	"	106.7	"	13.4g
150 -	92.2g	"	105.1	"	12.9g
					6)79.0
				Average -	13.16

#6 - 150 had 5000 lb pressure
" 148 " 5000 "

Blanks made in 2.137 dia. mold

#151-152-153+154 Rag Record wax

151-152-153 had 1800 lbs when pressing
154 had 1000 lbs

No 155, 156, 157, 158, 159 + 160 Blanks was made of Raw Montan wax with 40% chalk and coated with Shellac 15g titra 5g + zinc sterate 1/2 g
All cracked when pressed in mold except No-156

	weight of Blank before coating	after coating	diff
#155-	93.5g	104.6	11.1
156-	94.4 "	105.7	11.3
157-	92.5 "	104.9	12.4
158-	92.9 "	105.5	12.6
159-	94.4 "	106.0	11.6
160	93.7 "	106.1	12.4
		b	71.4

Average 11.9

Nos - 161, 162, 163, 164, 165 - 166 Blanks
was made of Raw montan wax with
20% Chalk and coated with, shellac 15 g
Extra Sand zinc stearate 1/2 g
All cracked or small cracks except no 164

weight of Blank before coating		after coating		
no. 161 -	86.2 g	96.9 g	diff.	10.7 g
162 -	83.4 "	95.7 "		12.3 "
163 -	82.1 "	96.4 "		14.3 "
164 -	84.1 "	96.9 "		12.8 "
165 -	85.4 "	97.4 "		12.0 "
166 -	86.5 "	99.2 "		12.8 "

6 | 74.9

Average 12.48

No 167, 168, 169, 170, 171 & 172 Blanks made from
2 min Record wax 40% chalk coated with
shellac 15 tetra 5 zinc iterate 1/2
Shellac dope did not coat very good on wax
blanks, surface of wax to oily

weight of Blank before coating		after coating	dif.
No. 167 -	91.4 g	104.9 g	13.5 g
168 -	89.7 "	104.6 "	14.9 "
169 -	89.7 "	102.7 "	13.0 "
170 -	91.1 "	105.1 "	14.6 "
171 -	91.5 "	102.6 "	11.1 "
172 -	91.1 "	105.1 "	14.1 "
			67.2
		Average	13.53

#173, 174, 175, 176, 177 + 178 - Blank made from 2 mins Record wax & 20% chalk, coated with shellac 15 tetra 5 gins stearate 1/2 - Shellac did not coat very good surface of wax Blank to oily

weight of Blank before coating		after coating	diff
No 173 -	82.9 g	95.0 g	12.1 g
174 -	82.6 "	94.8 "	12.2 "
175 -	83.1 "	96.9 "	13.8 "
176 -	83.7 "	97.8 "	14.1 "
177 -	81.9 "	95.9 "	14.0 "
178 -	83.3 "	97.0 "	13.7 "
			6 | 79.9
		Average	13.31

#179, 180+181 - 4 min, wax 7% Cotton Flock
Speed of Lathe 540 - Drop test - 14 inches
cracked on second drop, used No. 179 for
drop test
No. 180+181 to be coated with shellac mix
Shellac 15 tetra 5 gms tetralin and
put on cold test
Blanks warm when coated
Cold test 39 below zero. OK

#182, 183+184 - 4 min wax 5% Cotton Flock. Speed
of Lathe 540. Drop test 14 inches, cracked on
fourth drop. No 182 Blank used. 183+184 to be
coated with shellac mix and put — cold test
Blanks warm when coated
Cold test. 39 Below zero - Passed OK

#185, 186 + 187 - 2 min wet 7% Cotton Flock
Speed 540, drop test 1 inches - slight
crack at 25 drops then run it up to 3 #
times before it cracked full length of record
used No 185 Blank for test, No 186 + 187 to be
coated with shellac on part on cold test
Blanks Cold when coated
Did not coat very good when warm to oily
Cold test 39 Below zero. Records OK

#188, 189 + 190 - 2 min wet 5% Cotton flock
Speed 540 drop test 14 inches - very slight
crack on and sixth drop No-188 Blank
used for test. No 189 + 190 to be coated with
shellac and run on Cold test
Blanks cold when coated
Cold test Records OK at 39 Below zero

7% cotton flock

#191, 192 + 193 - 1/2 4 min wash 1/2 2 min wash
Spend 5-40 drop test 14 inches cracked at
27 drop - No 191 Blank used for drop test
No-192 + 193 Blanks to be coated with shellac
and put on cold test
Blanks coated when cold
Records OK at 39 Below zero

#194, 195 + 196 - 1/2 - 4 min wash 1/2 - 2 min wash
5% cotton flock - Spend 5-40 - drop test 14
inches cracked at 19th drop No 194 Blank
used for drop test No-195 + 196 Blanks to
be coated with shellac and put on cold
test
Blanks coated when cold
Records OK at 39 Below zero

No 197 - 4 min wash 7% wood pulp Speed 540
drop test 14 in crack at second drop

6 Blanks No 198, 199, 200, 201, 202 + 203
4 min wash 10% wood pulp. temp 310
Speed when spinning 1460. used No 203 on
drop test height of drop 14 inches cracked at
fifth drop

4 Blanks No 204, 205, 206, 207
4 min wash 7% wood pulp Speed when spinning
1460. Drop test 14 in cracked at third drop
No. 204 Blank used for test

4 Blanks No 208, 209, 210 + 211
4 min wash 5% wood pulp Speed when spinning
1460 - Drop test 14 in Cracked at second
drop No 211 Blank used for test

4 Blanks No 212, 213, 214, 215
4 min wool 10% Cotton Flock Speed when
Spinning 1460 Drop test 14 inches cracked
slightly inside at 16th drop cracked outside
at twenty first drop No 212 Blank used for
test

4 Blanks No-216, 217, 218, 219
4 min wool 7% Cotton flock Speed when
Spinning 1460 Drop test 14 inches very
slight crack on inside at fifth drop
No 217 Blank used for test

4 Blanks No. 220, 221, 223, 224
4 min wool 5% Cotton Flock Speed when
Spinning 1460 Drop test 14 ins. slight on
fourth drop. No 220 Blank used for test

4 Blanks No 225, 226, 227, 228
2 min wax 10% wood pulp Speed when
Spinning 1460 temp 360 Drop test 14 in
slight crack at fourth drop No 225 Blank
used for test

4 Blanks No 229, 230, 231, 232
2 min wax 5% wood pulp - Speed when
spinning 1460 Drop test 14 in Cracked on
first drop No 229 Blank used for test

4 Blanks No 233, 234, 235, 236
2 min wax 7% Cotton flock - Speed when
spinning 1460. Drop test 14 in. Chipped
a little on end at 45th drop - No 233
Blank used for test

4 Blanks No 237, 238, 239, 240
2 min wax 5% Cotton Flock Speed when spinning 1460 - Drop test 14 in - slight crack on end 12th drop No - 237 Blank used for test

4 Blanks No 241, 242, 243, 244 10% wood pulp
1/2 - 4 min wax 1/2 - 2 min wax Speed when spinning 1460 Drop test 14 in slight crack on end at 11th drop - No 243 Blank used for test

4 Blanks No 245, 246, 247, 248
1/2 - 4 min wax 1/2 - 2 min wax - 7% wood pulp Speed when spinning 1460 - Drop test 14 in. Cracks on second drop No 245 Blank used for test

4 Blanks No 249, 250, 251, 252
½ - 4 min wax ½ - 2 min wax 5% wood pulp
Speed when spinning 1460 1460 Drop test
14 in. cracked on first drop No 249
Blank used for test

4 Blanks No 253, 254, 255, 256
½ - 2 min wax ½ - 4 min wax 10% Cotton Flock
Speed when spinning 1460 - Drop test 14 in.
Chipped on second drop and cracked on
third drop No 253 Blank used for test

4 Blanks No - 257, 258, 259, 260
½ - 4 min wax ½ - 2 min wax 7% Cotton Flock
Speed when spinning 1460 - Drop test 14 in.
Cracked on second drop

4 Blanks No. 261, 262, 263, 264
½ - 2 min wax ½ + min wax 5% Cotton Flock
Speed when spinning 1460 - Drop test
14 inches slight crack on second drop
No. 261 - Blank used for test

Mix for Blue Records

No. 1 mix - 5 g tetra ½ g zinc stearate
200 mg Victoria Blue B. Base,
From Heller + Mertz
To 15 g Shellac add 5.7 g of
No. 1 mix

Blanks made in 24 building

#1 Dope put on temp 230 to 240 F warm
blanks. blanks run 80 Rev stirrer at 217 R

#2 Dope put on temp 280 to 290 cool blanks
blanks 80 R stirrer 217 R

#3 Dope put on 270 to 280 warm blank
blank run 80 stirrer 217 R

#4 Dope put on at temp 280 to 290 Cold blank
blank run 48R steam 217 R

#5 Dope put on temp 280 to 290 warm blank
blanks run 48R steam 217 R no dye put in

#6 Dope put on temp 270 to 280 Cold blank
blank run 48R steam 217 no dye put in

#7 Dose put in temp 270 F 200 cold blanket
blanket on 88 R saturn 217 no dose put in

#8 Dose put in temp 240 F cold blanket
blanket on 80 R saturn 217 40 grains
rice mix 1 grain of Phenacetin dose
was very signif

Exp. to have Shellac varnish stick to Blanks

#1000 · 4 min wax 90 g Rosin 10 g
6% Cotton Flock (NG)

#1001 4 min wax 80 g Rosin 20 g
6% Cotton Flock Mold Oven temp. 270
temp of wax 270 (NG)

#1002 – 4 min wax 70 g Rosin 30 g
6% Cotton Flock Mold Oven temp 270
temp of wax 270 Cant extract at normal temp ahead to put on ice.
Want extract good spots of wax stick to mold (NG)

1003 Venice turpentine dissolved in Carbon tetrachloride for Prime coat
(N G)

" 1004 Venice turps dissolved in Shellac Varnish
(N G)

" 1005 Venice turps dissolved in Carbon tetra then put in Petts oven all night temp of oven about 150. In morning turps all evaporated in coat
(N G)

" 1006 Venice turps dissolved in Carbon tetra then mixed with Shellac varnish then put in Petts oven
(N G)

1007 Took 2 of No 1005 put on another coat of Venice turps dissolved in Carbon tetra
(N G)

Better than Reg

1008 Raw Montan 90 Rosin 10 6% Flock
Melting point to low about 160

#1009 Raw Montan 45 - 4 min wax 45 -
10 Rosin 6% Flock
not very good Pin holes in blanks

#1010 - 2 of No 1009 Coated with Venice turps
for Prime Coat

#1011 - 4 min wax 95 Rosin 5 - Flock 6%
Venice turps dissolved in Carbon tetrachlor
for Prime coat

#1012
90 Raw Montan 5 Rosin 25 White wax
6% Flock - would stand more flock

#1013
90 Raw Montan 5 Rosin 50 white wax
6% flock

#1014 – 90 Raw Montan 5-0 white wax 6% flock . Dont mix good - Pin Holes

#1015 – 90 4 min wax . Rosin 2 5 white wax 6% Flock

#1016 – 90 4 min wax 5 Rosin 5-0 white wax 6% Flock

#1017 – 90 4 min wax 5-0 white wax 6% Flock Dont mix good Pin holes

#1018 – 90 Montan 2 5 Gilsonite Flock 6%

#1019 – 90 Montan 5-0 Gilsonite Flock 6% sticks to mold temp. when poured 8 40

1020 – 90 4 min wax 2 5 Gilsonite 6% flock sticks to mold

#1021
90 - 4 min wax 12½ Gilsonite 6% flock
sticks to mold

#1022 - 90 - 4 min wax 5 Gilsonite
6% flock - sticks

#1023 - 90 - 4 min wax 5 Gilsonite
5 stearic acid 6% flock

#1024 - 90 - 4 min wax 10 Gilsonite
5 stearic acid 6% flock - sticks

#1025 - 120 - 4 min wax 75 Rosin
30 chalk 45 Gilsonite 6% flock
(sticks)

#1026 - 120 - 4 min wax 75 Rosin
60 chalk 45 Gilsonite 6% flock
- sticks

#1027 - 120 - 4 min wax 75 Rosin
60 chalk 45 Gilsonite 40 stearic acid
6% flock

#1029. Given 5 coats 3 hrs between each coat left in drying Room 7 days befor pressing. Sticks Good

#1028
Montan 180 Rosin 50 chalk 120
13 flock (chipes out slightly on
Blank

#1029
180 Montan Rosin 50 chalk 75
12 flock + - not Practical in
molding Blanks. Sticks to mold in sports

#1030 - 180 4 min wax 50 Rosin
chalk 100 flock 14 - Stuck

#1031 - 184 - 4 min wax 50 Rosin
chalk 125 flock 14 (340°)
stripe

#1032 - 184 - 4 min wax 25 Rosin
chalk 100 flock 12 (stripes)

#1033 - 200 Montan 25 Sod. Stearate
13/n flock Bond mix good

5 coats 3 hrs between each coat in drying Room 7 days

1035 No good for sticking - 5 coats 3 hrs between coats in drying Room 7 days

1036 No good for sticking 5 coats 3 hrs between coats in drying Room 7 days

#1034
200 Montan 50 Soda Sterate
13½ flock

#1035 - 200 Montan 75 Soda sterate
16.5 flock

#1036 - Montan 200 - Soda Sterate 100
flock 18 Pound at 280

#1037 - 200 4 min wax 25 Sodium Sterate
13.5 flock - Pin Holes

#1038 - 4 min wax 50 Sodium Sterate 6
Pin Holes

#1039 - 210 Rosin 4% flock 55 chalk
stuck

#1040 210 Rosin 55 chalk 25 Sodium
sterate 4% flock stuck on cop

#1041
210 Rosin 5.5 chalk 75 Sodium Stearate
6% flock Stick NG

#1042 250 white wax 12% flock
Sodium Stearate 50 Pin Holes

#1043 Rosin 10 Caranoba wax 2 chalk 1
flock 1 Sticks

#1044 Rosin 10 Gilsonite 5 1/2 flock
Sticks

#1045 Rosin 10 Gilsonite 5 chalk 4
Sticky

#1046 Rosin 10 Gilsonite 5 chalk 4
Montan 2 Sticky

#1047 Caranoba 5 Sodium Stearate 1
NG

#1048
Caranoba 5 Rosin 2 — Streaks

#1049 White wax 5 Sod. Stearate 5 flock 6%
Pin Holes

#1050 White wax 10 Sod stearate 5
flock 6% Pin Holes)

1051 White wax 10 Sod stearate 5
Rosin 10. Flock 6% — streaks

1052 250 white wax 6% flock — Pin Holes

1053 250 white wax 50 Japan wax
6% flock Pin Holes)

1054 250 white wax 50 Japan wax
50 Black Ozokerite 6% flock
Pin Holes not good Paint

1055 Black Ozokerite 5 white wax 1
6% flock (streaks)

#1056
High Speed Blanks prime coat of Air Drying Japan Put in Petits oven 14 hrs at about 150°

#1057 Black ozokerite 5 white wax 2 flock 5 (stiff)

#1058 High Speed Blanks prime coat of Bakerlight. In Petits oven 14 hrs

1059 High Speed Blanks prime coat of Sol. from Hookerjosh

1060 Enamel from Hookerjosh called Pecora Cuticle Enamel - 11.9 Foot Step

#1061
150 Raw Montan Rosin 40 chalk 95 flock 12 (Chips on Extraction

#1062
150 Raw Montan Rosin 50 Infusorial Earth 10 - Flock 13 180 (Chips on Extraction

#1063

250 Raw [illegible] Rosin 50 Flock 16.8
Infusorial Earth 10 Chips

#1064 – 200 Raw [illegible] Rosin 50
Flock 19.80 Infusorial Earth
Chips on Extraction

#1065
180 Raw Montan treated by [illegible] Dodd
50 Rosin, Infusorial Earth 20
Flock 13.80 Chips on Extraction

#1066
180 Raw Montan treated by [illegible] Dodd
50 Rosin Infusorial Earth 20
13.80 Flock Lamp Black 5 (Sticks)

#1067

Dup of 1066 Except 10 Lamp Black
chips

#1068 Raw Montan 180. Rosin 50
Flock 10 Chalk 75 Lamp Black 20
chips.

#1069

Dup. of 1068 Except 80 Lamp Black
(chips)

#1070
50 Rosin treated with Zinc Oxide –
2½, then 180 Raw Montan [illegible] #1073
Chalk 50 – (chips)

#1071 – Rosin 5 tetrac[illegible] [illegible]
#1072 – " 5 " 1
#1073 – " 5 " 1½
#1074 – " 5 " 2
#1075 – " 5 " 3

#1076 Raw Montan 90 – 5 of No. 1074
7% flock ~~25~~ Chalk Strips & Rolled

#1077 4 min wash 90 – 5 of No. 1074
7% flock 25 chalk

1077 4 min wash 180 – 5 of No 1074 7% flock
50 chalk

#1078X 700 Bold' Montane
200 Rosin
400 Chalk

#1078XX
700 Raw Montan
200 Rosin
Melt + filter — add Chalk 400
300°F

#1078XXX Raw Montan 600 — Bark Crude Rosin 200
Melt together Raise temp 450° + filter — add Chalk 500

1050
NG Cracked — Drying Room

1082X 700 Raw Montane
200 Rosin
250 Infusorial Earth
Temp. 300°

1078 — 175 Raw Montan 700
50 Rosin 200
100 Chalk — Sticks 400

1079 175 — 4 min wax
50 Rosin
100 Chalk Bowl + Stick

#1080 175 Raw Montan
50 Rosin
Coated at 2 58 Opening 1/32

1081
175 — 4 min wax
50 — Rosin
Bowl + Stick
Coated at 240 Opening 1/32

1082
700 Raw Montan
(Limit 280) 200 Rosin
~~250~~ Infusorial Earth
Coated at Opening Sticky

#1084X Raw Mountain ✓ 700
Rosin 400
Infusorial Earth 288
Temp. 300

#1084XX Sept 12th Raw Mountain 700
Rosin (Bark Crude) 400
Melt - Temp 430° + filter
Requires 3 hours to clear off
the profile.
Add Infusorial Earth 270
Don't raise temperature above 310°F.

#1084XXX Sept. 17th
Raw Mountain 700
Rosin (Bark Crude) 400
Heat to 450°. Evaporate all
Bubbles Reduce temp to 400°
and filter - time consumed 2½ hrs.
then Add Infusorial Earth 260.

#1083
4 Min Record Wax 700
Rosin — 200
Infusorial Earth 337
Coated at Opening

#1084 Raw Mountain 700
Rosin — 400
Infusorial Earth 412
Coated at Opening

#1085 - 4 min Record wax 800
Rosin — 450 ✓
Infusorial 280
Coated at Opening ~~#10~~

#1086 Raw Mountain 700
Rosin — 400
Coated at Opening

#1087 - 4 min Record Wax 700
Rosin — 400
Coated at Opening

#1092 X 4 mi wax 250
Rosin 100
Silcrete 150
Shellac M.E. 100

1093 X Same as #1093 except use
only 150 Earth .....

#1088 Water 200 cc Plaster Paris 150
5 - flock

#1089 Water 200 cc Plaster Paris 200
flock 10

#1090 Water 200 cc Plaster Paris 200
flock 15

1091 - 4 mi wax 240 - Rosin 150
Silcrete 100 Dont stick

1092 4 Sid. Wax 240 - Rosin 100
Silcrete 110 Dont stick

1093 Raw Montan 600
Dark crude Rosin 250
melt, Raise temp to 500° and
lower temp to clear off Bubbles
filter at 400°
add Impressional Earth (maximum limit) 170.

#1094 Raw Montan 600
Dants Crude Resin 250
Melt - Raise temp to 500°
and add
1 lb Pike Rock clay 2.00
after well mixed - filter

#1095 - Take #1092 after filtered
through linen Bag ..... 750 parts
Melt & add Infusorial Earth ..... 75 "
will take no more

#1096 Raw Montan 700
Rosin 200
Gilsonite 100
Infusorial Earth 140

[ITEM FOUND IN BOOK]

Dally #16

Make 4 times Regular lot of shellac mix - pour out plate about 5 inches diameter -

Change proportions. 17
50 15 Lac 4 Tetra 12 asbestos

another lot -
#18 - 15 Lac 5 Tetra. 12 asbestos and 15 chalk

another lot,
#. 15 Lac 3 Tetra 10 asbestos

#20

Dally Make one record without asbestos

shellac 135 tetra 45

~~Make one record without asbestos~~

[ITEM FOUND IN BOOK]

#21

Daily

Try your Resin in place of Shellac using same proportions of Tetra + Asbestos but substituting the Resin for the shellac

Resin 150g Tetra 50g asbestos 60g Disk
Regular record 562.5g Resin 187.5g Tetra
22.5 Asbestos #31
~~3.75 1.25~~ 1.5
~~[illegible]~~

#22

Daily

Make the regular face mix but at 10% of flowers of Sulphur at the end just before you pour, + stir well but quickly

shellac 150 Tetra 50 Asbestos 60
flowers of sulphur 26

[ITEM FOUND IN BOOK]

N

Dally—

Take some of the Coarse Asbestos
run it through the Rolls in
Machine shop set very close
together, screw out the juices
before trying it & only pass
through the Coarser
pass stuff from several times
& let me see it under
Microscope

Bintrotolol 12 asbestos
#23 15 Lac 4 Talva 1 Nitrololol 12
Bintrotolol
#24 15 Lac 3 Talva 2 Nitrololol 12 asbestos

#25
15 Lac 4 Talva 1 Paraformaldehyde 12 asbestos
#26
15 Lac 3 Talva 2 Paraformaldehyde 12 asbestos

#27 Dimmidin Base
15 Lac 4 Talva 1 Dianisidin 12 asbestos
#28
15 Lac 3 Talva 2 " "
#29
15 Lac 4 Talva 1 Nitroanisol Pona 12 asbestos
#30 " 2 " "

[ITEM FOUND IN BOOK]

Nov - 19 - 1910

Mr Ott.

Cold test on Records.

131-132-133

were put on ice test and
and did show any cracks @
-

When they were put in Calm
his Test

1 was cracked after 30 min @ -40
" 2 " " " " " " "
" a " not cracked " " "
" B " " " " " " "
were after taken in warm room
a - B were OK

Christiansen

Jan 6 - 1910

#2

Cold test on Records from Ott
Lot # 2

Time	Test 92	Test 95 F	Fails	Remarks
400 P.m	1-8	17.6		
420 "	" 2 "	28.		# 131-132-132
500 "	" 7 "	+1.4		" 134-135-137
500 "	-34 "	-29		" 135-139-140
530 "	-40	-40		" 145

Lot # 2 - 10 Records
were taken directly from Room temperat
into 17.6 °F
and again from -40 into room temperat
a jump from 68° - 17° = 51° into cold
" " " -40 - 68 = 108° " warm
All were OK
were also OK
Table of reading above

Chr.-

Jan. 9-11

#3

Cold Test on Records
For Mr. Ott.

Lot # 3 - 12 Records

Time	Test °C	Test °F	Skids	Remarks.
9.10 a.m.	+3	37.4		
9.45 "	-6	21.2	½ open	at 11.15 iron was
10.15 "	-15	+5	all open	filled again
10.45 "	-20	-4		with CO_2
11.15 "	-35	-31	sides all open	
11.35 "	-40	-40		Records are without
11.45 "	"			cartons
12.00 Noon	-41	-41.8		
12.30 P.M.	-42	-43.6		
1.00 "	-44	47.2		
1.30 "	-44	47.2		

Lot # 3 - 12 Records after gradually lowering the Test. held at -40° to -47° for two hours. All OK at -47°F
a jump of 240°F OK
From -47°F into boiling Water OK
Constantine

#4

Cold test on Records
for Mr. Ott

Lot # 4 - 4 records

Time	Test °C	Test °F	Skids	Remarks
1.50 P.M.	-40	-40	Sides all open.	
2.20 "	-36	-32.8	" closed.	Used CO_2
2.55 "	-27	-16.6	" "	which was used
3.30 "	-20	-4	skids all open.	for Lot #3
4.10 "	-25	-13	sides "	"
4.20 "	-31	-24		# 131-134-135-136

Lot # 4 - 4 records
Put into -40°F from 68°F in Room Temp.
Kept for 2 hours between -40 to -30
All OK

PS # 142 got a dent when taken out and cracked completely
Constantine

Phonograph Records on Cold Test
Feb. 6th.
Lot # 6 - 12 Records
70-81-83-84-86-87-89-90

9 Jan 25-11

-92-93-95-96

Time	Test C	Test F	Freezing Box	Remarks
11.00 a.m.	25			92, 11.10 put
12.00	0	32	Hydrogen 1/3	Box between
1.00 p.m.	-20	-4	" " 2/2	11-12 a.m.
1.30	-26	-14.5	" " "	
2.00	-29	-20	" " all	
2.30	-30	-22	" " "	
3.00	-31	-23.5	Solid 1/2 open	
3.30	-36	-32.5	" all "	Now covered
4.00	-36	-32.5	" " "	Records 80, 79, 81, 83, 84, 86, 87, 89, 90, 92, 93, 95, 96
5.00	-39	39.	" " "	

Lot # 6 - 12 Records after a 6 hour cold test down to -39°
were all ok

They were taken from -39° into 62°F
all ok.

Christman

[ITEM FOUND IN BOOK]

4 min wat	10%	wood pulp	4 blanks	speed	1460	No 1, 2, 3, 4, 5, 6
"	7 "	"	"	"		No 19, 20, 21, 22
"	5 "	"	"	"		7, 8, 9, 10
"	10 "	Cotton Flock	"	"		23, 24, 25, 26
"	7 "	"	"	"		27, 28, 29, 30
"	5 "	"	"	"		31, 32, 33, 34
2 min wat	10 "	Wood Pulp	"	"		11, 12, 13, 14
"	5 "	"	"	"		15, 16, 17, 18
"	7 "	Cotton Flock	"	"		35, 36, 37, 38
"	5 "	"	"	"		39, 40, 41, 42
1/2-4 min wat	1/2-2 min wat	10%	wood pulp	4 Blanks	speed	1460	43, 44, 45, 46
"	"	7 "	"	"		"	No 47, 48, 49, 50
"	"	5 "	"	"		"	51, 52, 53, 54
"	"	10 "	Cotton Flock	"		"	55, 56, 57, 58
"	"	5 "	"	"		"	63, 64, 65, 66
"	"	7 "	"	"		"	59, 60, 61, 62

Duplicate the above at a lower Speed - 540

4 min wat	9%	Cotton Flock	3 blanks	speed 540		No 67, 68, 69
"	5 "	"	"	"	"	" 70, 71, 72
2 "	7 "	"	"	"	"	" 73, 74, 75
2 "	5 "	"	"	"	"	" 76, 77, 78
1/2-4 "	wat 1/2-2 min wat	7%	Cotton	3 blanks	speed 540	" 79, 80, 81
"	"	" 5 "	"	"	"	82, 83, 84
4 "	" 7%	cotton flock	1 blank	"	"	197

No- 1	height dropped 14 in -	times dropped		No- 78	height dropped 14 in -	times dropped
" 19	"	5				
" 10	"	3		75	"	25 "
" 23	"	2		76	"	6
" 28	"	16		79	"	27
" 31	"	5		82	"	19
" 11	"	4		197	"	2
" 15	"	4				
" 35	"	1				
" 39	"	43				
" 43	"	10				
" 47	"	6				
" 51	"	2				
" 55	"	1 Bad				
" 59	"	3				
		2				

Notebook, N-00-02-27

General Analyses
& Experiments

Work of Geo. Horn and
Mr Grau under supervision
of John Coleman Stempel

Book #2:

Flag, Mr. Edison

SiO_2	43.48
Al_2O_3	21.24
Fe_2O_3	23.64
CaS	.24 — { total S .105
CaO	5.88
MgO	.77
MnO	Trace

Alkalies
Moisture

Magnesia asbestos

25% $MgCO_3$

SiO_2	22.3
Al_2O_3	3.03
$CaSO_4$	1.80
$CaCO_3$	50.00
$MgCO_3$	42.17

Loss on Ignition.

~~49.6~~% 51% of wt.

Magnesia asbestos

8.5% $MgCO_3$

SiO_2	5.46
Al_2O_3	2.96
$CaSO_4$	1.40
$MgCO_3$	87.04

Loss ignition

49% of wt.

Pages one. Phil

Dolomite

SiO_2 1.31

Al_2O_3 } 2.97
Fe_2O_3 }

$CaCO_3$ 54.

$MgCO_3$ 42.06

Williams Ore.

Fe_2O_3 = 50 %

Zn metalic = 16 %

Looks like
iron pyrites with zinc

Iron ore.
Concentrates Baltimore

Fe_2O_3 =

S = .033 %

P = .105 " ?

TiO_2 = .75

Examination of Edison Battery Jacket for Gordon Dualitabline.

	Edison		Gordon
For Chemicals Edison. Mark 3½% Gordon Mark 4½"	SiO_2	>	SiO_2
	Al_2O_3	>	Al_2O_3
	CaO (low)	<	CaO
	SO_3	—	Mn + Zn SO_3
	P_2O_5	—	P_2O_5

Non-magnetic Zinc Tails Rietine

Zn = 40.00%

Metallic Fe = 5.89

Zinc. Magnetic

Zn = 8.42

Met. Fe = 37.80

Nov 8/90. 930

1. Naphthalene treated with conc. H_2SO_4 produced a mixture of α and β naphthalene sulphonic acid. Sodium salt of β compound ~~[illegible]~~ soluble in water.

Sodium naphthalene sulphonate tried with different proportions of rosin. Tallow and stearic acid does not form anything like a good wax.

2. Chlorine passed into naphthalene till mass

became cloudy. A mixture of chlor derivatives. Mixed with proportion to form a naphthyl chloride with sodium chloride.

3. $KMnO_4$ with naphthalene forms phthalic acid.

4. $K_2Cr_2O_7$ oxidizes to phthalic acid.

Phthalic acid will not combine to form an iron substance with rosin or stearic acid

5. $MnO_2 + H_2SO_4$ forms with $C_{10}H_8$ a resinous acid not suitable for after re-sublimation.

6. Conc. HNO_3 formed at first mono nitro naphthalene low melting point.

Best results obtained with mono nitro naphthalene

(1). 33 % $C_{10}H_7NO_2$

33 " stearic acid

33 " paraffin

(2). 25 % $C_{10}H_{7}NO_{2}$
25 % stearic acid
25 " paraffin
25 % resin

(3). 50 % $C_{10}H_{7}NO_{2}$
50 % stearic acid

None of these gave a satisfactory wax but approached it in being more crystalline and ~~approxim~~ fairly firm texture

7. Further treatment of mono nitro naphthalene with conc. HNO_3 gave di nitro naphthalene higher melting point.

Tried many combinations of this substance with chloric acid resorcin and paraffin but none successful

8. A di nitro naphthalene nitrate reduced with hydrogen formed a compound

pounds probably
amido nitro naphthalene
which gave no better
results –

Acetylene Exp.

2 grams of carbide gives about 700 c.c. of gas -

Solution of $CuSO_4$ did not take out all odor -

Alkaline soln - tow made by dissolving ppted $Cu(OH)_2$ in 25% solution of boiling potash took very nearly all odor out

but seems to form too much black residue for phosphide copper unless phosphorus is present in large quantities -

Pt. collected from tubes separated from pumice stone and examined showed presence of small amounts acetylide of copper.

Nitr. $CuSO_4$ in Tubes.

3.3 litres gas take .055 gms $CuSO_4$

or 1000 cu ft take 1 pound.

Exp. with.

Citrate of iron and ammonium in 1st tube

Fe acetate in 2nd

Fe Cl_3 in 3rd and

Pb acetate in 4th with

$CuSO_4$ in 5th and

alkaline copper in

last. Only last

2 Tubes showed
a pft. with 3 liters
of gas and gas at
outlet had same
perceptible odor as
from the 9 Tubes
of Cubes 4 -

Uay [illegible]

[illegible]

1700

~~Sat~~ naphthaline and con. HNO_3 (1 of $C_{10}H_8$ to 4 of HNO_3 by weight) in dish. Allowed to stand [illegible]

1701

About 200 cc of Potassium Chromate with about 25 cc of con H_2SO_4 was placed on steam bath having been added about 20 gms. $C_{10}H_8$. Allowed to stand on steam bath a few hours. Filtered & allowed filtrate to stand

No Good

#702

200 cc of $K_2Cr_2O_7$ in beaker with 25 cc of HCl and 20 gm $C_{10}H_8$ placed on steam bath over night. Diluted, filtered and allowed filtrate to stand

No Good

#703

200 cc of $K_2Cr_2O_7$ in beaker with 25 cc $KMnO_4$ and 20 gm. $C_{10}H_8$ placed on steam bath. After standing for 24 hr. filtered.

No Good

*104

200 cc of $K_2Cr_2O_7$ and 25 cc of H_2SO_4 with 40 gms. resin placed on steam bath for four hours. Poured off liquid + washed with H_2O. Placed on dish. On drying the color was lost to a noticeable extent the sub. evidently having been oxidized

---

*105

200 cc of $K_2Cr_2O_7$ and 25 cc of HCl with 40 gms. resin placed in flask on steam bath for eight hours. Poured off liquid + washed with H_2O. Placed on dish. On drying the substance darkened considerably in color.

#706

About 20 cc $K_2Cr_2O_7$ with about 25 cc $KMnO_4$ add 40 gms resin. Placed on steam bath. for four hours. Poured off liquid + washed with H_2O, placed on desk. On drying the color was noticeably changed. Under microscopic examination the salt appeared quite homogeneous.

#707

To about 20 cc $KMnO_4$ (with about 25 cc H_2SO_4) and 20 gms $C_{10}H_8$ placed on steam bath.

No appreciable reaction.

#708

Took about 200 cc $KMnO_4$ and 250 cc HCl with 20 gms. C_6H_6 and placed on steam-bath for few hrs.
Poured off liquid - covered residue with [illegible] water & [illegible]. Found it made ash. Filtered off filtrate & dried its apparent reaction

#709

Took 200 cc $KMnO_4$ and 250 cc H_2SO_4 with 40 gms. resin. Placed on steam-bath. Solution soon changed from reddish to cloudy yellow.

[illegible]

The mass changed color on drying and in cross section was found to be quite homogeneous

500

Took 200 cc $KMnO_4$ and 25 cc HCl with 40 gms. resin & placed in steam bath

found 1/2 hour [illegible] medium on dry plate.

Changed soln. & drying and in cross section was found quite homogeneous.

March. 2, '00

711

Pure Chlorine for 20 minutes through $C_{10}H_8$ (50 gms)

Filter through cloth & allow it to stand. $C_{10}H_8$ crystallized out almost immediately.

712

Chlorinated $C_{10}H_8$ for $2\frac{3}{4}$ hrs. the chlorine coming over in good quantity only about $\frac{1}{2}$ the time.

The substance was much darker color than that of No 711.

713

Continued. $C_{10}H_8$ for 7 hours. At one time a small quantity from the washing was allowed to flow, causing a cloudy appearance & on passing more CO_2 through an oily substance appeared upon surface. Also some of the Caustic Soda Solution was sucked into flask. The $Zn.$ $C_{10}H_8$ was set aside in dish. A substance crystalizing out. The current was not constant a great part of the time

No. 5 Continued 150 grms. $C_{10}H_8$ for 9 hrs. Current quite steady but not very strong. Same appearances as 713

"714 Chlorinated rosin covered with H_2O in flask for 1 hr. The soda was boiled so the exp. was repeated on solid rosin 715

"715 Chlorinated rosin as above for 2 1/4 hrs. The substance ~~burned~~ dark in color it being in a liquid state. Upon cooling the mass became very brittle.

"716 Chlorinated melted rosin directly in bath for another fourth hrs. The sub. turned dark very quickly and became brittle on cooling. Very homogeneous and having a smooth polished surface all the odor characteristic of rosin having disappeared. Still sticky to touch. Not as brittle as plain rosin

8/17

Took 20 gms. resin W. W. and 20 gms. pain in 1120: and melted together in ~~[illegible]~~ for 3¼ hrs. Sub became very dark in color, brown; not quite a black. Soft and sticky

7/8 Eliminate 20 gms. $C_{10}H_8$ and 20 gms. resin for 4 hrs. Substance turned dark in color (brown). Did not present a surface as homogeneous as 7/6 and 7/7.

719
Took 20 gms. of $C_{10}H_{22}$ and 20 gms. paraffine melted. [illegible] and cleanised for 2 hours. Substance was very [illegible] and homogeneous. J.G.

720
Took 10 gms. wood tar pitchound, 15 gms. [illegible] melted & cleanised for 2 hours.
Rather hard, brittle, dry

#721

Took 100 gms. paraffine (120) melted & added first 10 gms. wood tar pitch then adding 20 gms. at time until 60 gms. had been added. The mass ~~pitch~~ added 1½ lb. [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] added to compound 60 gms. paraffine & 60 gms. [illegible] [illegible] gms. [illegible] [illegible] [illegible] away. [illegible] [illegible] [illegible]

#722

Took 100 gms. paraffine (120) & added [illegible] melting point 10 gms. at 20 and [illegible] [illegible] alum until 110 gms. had been added [illegible] gms. added the [illegible] in [illegible] & [illegible] on cooling [illegible] & the compound of 100 gms. [illegible] 110 gms. [illegible] The [illegible] [illegible] was light & slow & [illegible] as if [illegible] [illegible] done. It was a little gummy.

#723

100 gms. paraffine (120°)
110 gms. mod. pitch
8 gms. carnauba wax

Melted together, then added
15 gms. magnesium resinate
Not brittle enough. So added
15 gms. lemon of mg. resinate
and moulded small by finger
which has a reddish brown color.

#724

100 gms. paraffine (120°)
110 gms. resin (N W)
16 gms. manila gum
Heated mostly but is too gummy

Hickey

=729=

by weight

5 1/2 g wood tar pitch	16 1/2 gms.
5 g paraffine	15 gms.
1/2 g carnauba wax	1 1/2 gms.
5 g Ca. resinate (Ern. 13)	15 gms.

small cylinder was formed. Lighter in color than 728 but cooled far more rapidly. The Ca resinate seemingly having better effect than Mg. resinate. (Cylinder broke during cooling and after not worth a d — Impossible to mould decently.)

726 Cominated for one hour
55 gms. resin
50 gms. paraffine

Turned very black in color, in
[illegible] oil, [illegible] time
a substance [illegible] very
shaky used.

727 Cominated for one hour
55 gms. wood tar pitch
50 gms. paraffine

728 Mixture of 727 remelted + recominated
for ½ hours. The mixture carbonized
& was therefore used as a wax.

(Ce 723)

Mar. 1/09

72 Cleinated for 1¼ hours

100 gms. [illegible]

110 gms. [illegible]

8 gms. [illegible]

30 gms. [illegible]

---

30 Cleinated for 1¼ hours (Ce 724)

100 gms. [illegible] (120°)

110 gms. [illegible] (W W)

16 gms. [illegible] gum.

731 [illegible] (731)
8 gms. [illegible] acetic
2 gms. [illegible] (130)

Heat 80° [illegible]
The mixture solidifies without [illegible]

[illegible]

[illegible]2 Mar. 12, 00.

Took 40 gms. $C_{10}H_8$ - passed Sulphur dioxide through for one and three fourths hours. The color changed very slightly when the $C_{10}H_8$ melted. Current was good for about 30 minutes only. On cooling the $C_{10}H_8$ crystallized out.

No change.

#73

Passed SO_2 through C_6H_6 for one hour. H_2S, H_2 [illegible] not [illegible] boiling as in 732

#734 passed SO_2 through rosin for three hours.
The rosin turned [illegible] darker in color but on cooling the chemical composition of the rosin seemed unchanged.

#735 passed SO_2 through $27\frac{1}{2}$ gms. wood tar pitch melted with 25 gms. of paraffin (125) proportions same as 721, for two hours. When cold [illegible] charcoal nicely but is to sticky, color almost black.

Mar. 13/00

736 Passed NO through 80 gms. of $C_{10}H_8$ for 3/4 hour. On cooling the $C_{10}H_8$ crystallized out as in #732

#737 Passed NO through rosin (100) 50 gms. in 3½ hours. Rosin was considerably darker in color but remained fully as brittle when cold.

#738 Passed NO through 27½ gms. of rosin for fifteen minutes while melted with 25 gms. paraffine (120°) for 3 hrs. When cool the mass is similar to #735.

#739 Took 30 gms. $C_{10}H_8$ & passed H_2S through for fifteen minutes. $C_{10}H_8$ crystallized out. The ext. had a brown color.

740 Tork 30 gms. resin passed H_2S through for 45 minutes Jan. 14
Then was no visible change.

741 Passed H_2S for 45 minutes through 20 gms. wood tar pitch melted with 20 gms. paraffine (125°)
No apparent change.

744 Passed H_2S through 20 gms. wood tar pitch melted with 20 gms. paraffine (125°) for one hour. Too sticky

742 Tork 30 gms. resin, ground in mortar, filtered in cond. KNO_3 and allowed to stand. Next day yellow fluffy sub. Decided action.
Pour still strong stickness

Mar. 14

#743 Ground 50 gms wood tar pitch and covered with con. nitric acid & allowed to stand. Slight action.

#744 Passed H_2S through 50 gms wood tar pitch for one hour. Then cut it was homogeneous having a highly polished surface. Very little tar as sticky as before.

#745 Passed ammonia through 35 gms. $C_{10}H_8$ for 30 minutes. The $C_{10}H_8$ crystalized out on cooling. No apparent reaction taken place

Mar. 14

#746. Passed NH_3 through rosin for 20 minutes. Color in color of rosin was changed.

Mar. 18 1914

#747 Passed NH_3 through wood tar pitch for one hour. No appreciable changes.

#748 Passed NH_3 through 27½ gms wood tar pitch mixed with 20 gms. paraffin (m.p.) for ½ hour. Half hour after it was very gummy

#749 Took 20 gms. of #720 which is 5 gms. wood tar pitch & 15 gms. paraffin (m.p.) & heated for 2 hours. To this added 2 gms. sodium chlorate (60%) melted together. Not sticky but not gummy. Looks as if paraffin had carbonized.

Mar 15 00

750 Melted 15 gms. wood tar pitch with 4 gms. paraffine (M.P.) & allowed to cool. It was sticky. Corks in it paraffine had carbonized!

751
50% on 32 gms. of # 720
50% " 4 gms. Bismuth Iodide (B.I.)
50% " 4 " Potassic Manganate
Melted together.
Not gummy.

75-2

3/20/00 50% 704

50% Soda Phosphate 6.6 5-

[illegible] night [illegible] 5- during

night very [illegible].

Gummy

75-3

3/20/00 5-g 704

5-g. pain,

5-g. St. Soda 6.6 5-

Gummy

754 – Inscia 704 – the
mass is very brittle
3/20/00 Grow on hay common
form and striking.
The decrease in bulk
is considerable

---

755 Inscia 705
3/20/00 N. G.
Wolf
Mell

756 50 g. Carnauba
4/25/00 50 g. wood tar pitch
Pretty good
but sticky.

---

757 Saponified
4/25/00 Castor oil with
strong caustic soda
N. G.

---

758 Saponified
4/25/00 Cottonseed oil with
thick caustic soda
N. G.

759 400 g. Rosin wq
4/25/00 200 g. Cat.

760
4/25/00 100 g. Rosin wq
25 g MnO2

761 50 Car.
4/25/00 50 W.D.P.
10 par

pretty good
stick

762 7 pts car
4/25/00 1 pt. par
Total

---

21 pts $760
763 10 " car
4/25/00 5 " par
Paid per check

764

4/26/00 200 g. Rosin

1 g. Mud 2

765

5/1/00 Rosin melted

treated with

Conc. HNO_3.

766
1/7/00 Rosie treated
with cough syrup
a little sticky

767
1/7/00 Rosie treated
with cough syrup

768

5/1/00 Rosin treated with Aluminum Chloride

Apparently no reaction

769

5/12/00 100 gms rosin

1 c.c. conc H_2SO_4

Sticky

770
5/2/00 100 g. Nain www
2 c.c. conc H_2SO_4
Sticky

771
5/2/00 100 g. Nain www
3 c.c. Conc. H_2SO_4
Sticky

772
5/2/00 100 g. rosin WW
4 g.c.c. conc H_2SO_4
Not as sticky as the
others

773
5/2/00 100 g. rosin WW
6 g.c.c. conc. H_2SO_4
See # 777

774
1/3/00 100 g. Potass. Cyan.
10 g.c. conc H_2SO_4
See #777

775
1/3/00 100 pts Potass cyn
10 g.c. conc H_2SO_4
See #777

776
5/3/00 100 g rosin cow
12 c.c. cont'g Fe

see #777

777
5/3/00 100 g. rosin
12 c.c. cont'g Fe

Best of the lot.
less brittle than common rosin &
less sticky

778
5/4/00 100 g. [illegible]
2 c.c. conc HNO_3

779
5/4/00 100 g. [illegible]
4 c.c. conc. HNO_3

780

7/4/00 100 g. rosin wW.
" 6 c.c. conc. HNO_3

781

7/4/00 100 g. rosin wW
8 c.c conc. HNO_3

782
7/4/00 100 g. rosin wax
10 c.c. conc HNO3.

783
7/9/00 Acetate of lead
proportion 400 to
300 lead acetate
350 " "
400 " "
450 " "
500 " "
525 " "
550 " "

784 –
5/10/00 Solubility of Resinate
Iron in paraffine
No. very slightly
practically insoluble

---

785 –
5/10/00 Made rosin soap
and ppt the
resinic acids with
HCl.
The mixed acids have
the appearance of rosin.

Probably due to fire remove area

786
5/11/00 Remnants from
Acetic Ether
Very slightly

787 Methyl Spirits
5/11/00 Remnants from
slightly

788 Remnants from
5/11/00 Ethylsperm's
Slightly, scarcely a trace

789 Remnants from
5/11/00 Kerosene samples

790 Remnants from
5/11/00 Gasoline samples

791 Benzine
5/11/00 Permatt iron

792 Benzoe
5/11/00 Permatt iron
completely & readily

793 Chloroform
5/11/00 Permatt iron
readily even in cold

794 Carbon Bisulphide
5/11/00 Permatt iron
in the cold

795 Ether
5/11/00 Permatt iron
in the cold

796 Silicic acid
5/11/00 Bismuth Iron
soluble
(Whether a solution takes place or Transformation or both
provided a transformation)

---

797 Oleic acid
5/11/00 Bismuth Iron
soluble -
see ( ) F.)96

798

5/11/10 Naphthalin

Resinate Ba

readily soluble

Upon cooling the mass is hard + crystalline + cannot be softened up with paraffin as this throws out the resinate Ba

799

5/11/80 Stearate Soda

(Stearic Acid 700
Sal Soda 154)

Remnants Copper

Hard to say
just what does take
place — the Stearate
is colored green & has
a settlement at bottom

6/5/00 Boiled up

#777 with various

proportion Sulphur

The Sulphur goes in

very nicely with little

or no frothing

Upon boiling a while

chemical action commences

accompanied by froth

The resulting mixture is entirely

[illegible] from Brown-M is light yellow

[illegible] to red [illegible] with [illegible]

[illegible] not brittle but [illegible] but

[illegible] to crumble upon cooling

a little Cuban asphalt impure

[illegible]

6/7/00 [illegible]

[illegible] W. J. P.

[illegible] paraiem.

[illegible] W. J. P.

[illegible]

[illegible]

[illegible]

[illegible]

6/11/00

Mr Edison suggested finding a particular solvent for the resinates, then separating the insol. part, decompose with acids and then make sodium salt. His idea is to get rid of sticky portion. The resinates are completely sol. in Benzol, carbon bisulphide, Ether and Chloroform, naphtha, partially soluble in Kerosene, Gasoline, Methyl & Ethyl alcohol " Benzine,

Apparently unaffected by paraffine, ceresine

6/11/00 Treated the minerals of Ca, Ba, Pb, Al, Cu, and Iron and zinc with Kerosene, then decanted off the Kerosene solution and treated insoluble part with dilute HCl. The HCl and also dilute H_2SO_4 has little or no decomposing effect on the minerals.

6/17/00 Made rosin soap

with the idea of making a few ferrates. – Investigating the process to see if by – electrolyzing the sodium ferrate in KOH, oil which floated – see results to morrow

Also made partial saponification of the rosin

Also continued the oil of the ferrates in Potassium and Sodium – they do not appear to be decomposed by acids

a/13/00

Cement for John Ott.

5 pts rosin
2½ " plaster of Paris

Too hard

equal parts
rosin & plaster of Paris
Very hard

---

1 pt rosin
2 " plaster of paris

Too much plaster of paris

---

10 pts rosin
5 " plaster paris
1 " Japan wax
Too soft - w.h. hard but pliable

6/13/00

ppt. resinate of manganese from sodium resinate solution by means of a manganese salt

passed current through a solution of sodium resinate – a deposite appeared on the positive pole – white which upon fusion had the same appearance and sticky qualities of rosin – upon leaving the deposit in the solution over night, it all dissolved. – It is probably nothing more than the resinic acids. The solution has a

better conductivity than the acetalum solution of the same crack.

6/14/00 Continued the practice

Saponification of rosin

Passed hydrochloric acid gas through rosin - then added zinc-metal and then pass gas through again for 3 hours longer - shaking - then added sal soda - still slightly, apparently no change

Treated melted rosin with sulphur chloride - apparently the same compound resulted as when treated with flour sulphur but without the disagreeable smelling gas.

This Lowner appeared a little darker than the other -

Then bicoated it with some metallic zinc apparently no reaction -

Then added Hal soda which unites into combination immediately - Heating caused fluctuy.

Heated the chromic acids just by the current but found them unchanged

---

Continued washing the manganese residue

6/15/00

The portion of the remnants of PA insoluble in Kerosene is only one decomposed by acids even upon boiling - the pyro resinic acid is sticky and resin like in appearance

Made alcohol solutions of rosin and compound got yesterday and reduced with zinc + hydrochloric acid. With the latter solution, no reaction between zn + HCl occurred, but in former reduction took place

made Carbon bisulphide solution of rosin and then tried to reduce with nascent hydrogen, could not generate the H on account of great S. G. of CS_2

Evaporated off alcohol the resulting mass gelatinous looking, sticky, but hard before fusion - after fusion the stuff sticky & similar to rosin.

6/16/00

Treated room with hydrocyanic acid and sulphur in the proportions of three ounces of acid to sulphur amounts. The resulting compounds were mixed in order that they should provide the stickiness common to them.

6/1/00

Continue the hydrochloric acid treatment, also the hydriodic acid + phosphorus.

Have commenced a series of experiments - heating rosin with various substances under pressure - did considerable reading - First tried sulphur + rosin - ordinarily decomposes at the point of chemical combination + 1% by wt is lost in gases

6/19/00

Made two experiments under pressure with iron, sulphur, and Cuban Asphalt but just burst by explosion

Mr Mallory gave me a zinc ore to analyze - sampled it thoroughly and began work for zinc determination and one for a qualitative examin.

6/20/00

Continued Zinc re analysis found it necessary to report Zn as Zn & first & then as basic carb.

Heated rosin + ∫ under pressure also rosin + $ZnCl_2$ again. about under pressure & in fran – See # 103 & etc

6/1/00

The more explosions.

Heated again with gas & with the purpose of drying & further working up the product

Finish the quiz determination but just as about to weigh the steam litter spoiled them, so must repeat.

Have decided to stop heating materials in glass tubes.

Too expensive

1. dangerous

The experiments that have been finished give little or no encouragement for continuing along this line

6/27/00

Started and practically finished the zinc determination

Boiled up the concentrated — with zinc chloride with sodium stearate, sodium resinate — with the idea of a possible joining of the stearic acid radical with that of the rosin and the two rosin radicals together.

~~for tomorrow~~

Passed HCl gas through the concentrated with zinc chloride no change except increased stickiness

10/27/00 Saturday

Weighed the zinc ortho & reported them to Mr Mallory.

Tried to get a reaction to occur between chlorinated naphthalene and the sodium salt of stearic & rosin. That is endeavored to form an ester of the naphthalene & stearic acid & rosin. Kept it at temp of 140° C for fours hours in sealed tube but apparently no reaction, will continue Monday.

Passed HCl gas through stearic acid so as to formed an addition product, then will treate

this compound same way
as the chlorinated naphthalene
It is darker & more liquid
than plain oleic acid. We
also further chlorinate it but it
will be practical commercially
We also try this latter
reaction in alcoholic solution.

6/23/00 Continued the experiment started Saturday - for results see Book 4.

Also started a qualitative analysis of an OTC sample.

6/26/08.

Also the new chemist started in, had him making sulphate Mg & Phosphate of Mg. Continued on the one and began qualitative analysis.

Also did work on the battery for Edison Mfg. Co. See BK. on Ed. Mfg. Co.

Notebook, N-00-03-12

Phonograph Cylinder
Book # 3

John Clarence Shengle

Pt # 659 - 660 - 661 - 662 & 666

#661 is that one "662" kept but not

Do good as regular.

Both are gummy with tannin, larger c/c

665 = 3/12/00	95% " 5% 1% Black Cerumin
667 - 3/12/00	90% " 5-1 10% Blk Cerumin
668 3/12/00	85% " 5-1 15% Blk Cerumin
669 3/12/00	95% " 5-1 5% Japan wax
670 3/12/00	90% " 5-1 10% Japan wax
671 - 3/12/00	40 g. Stearic Acid (7.50) 10 g. Stearic acid ~~30 g.~~ Tween wg ~~20 g.~~ Blk cerumin 5-g. Mg CO_3

Butter, Hard, 7.9.

6)2 — 40 g. Stearate Soda 7.50
10 g. Stearic Acid
3/12/00 — 30 g. Wood tar pitch
20 g. Blk Ceresin
1 g. Mg CO_3

Brittle, Hard, N.g.

---

6)3 — 40 g. Stearate Soda 7.50
10 g. Stearic Acid, Brittle,
3/12/00 — 30 g. ~~Wood tar~~ Burgundy pitch, Wood tar
20 g. Blk ceresin, dry as
1 g. Mg CO_3 CO_2 N.g.

---

6)4 — 40 g. Stearate Soda 7.50
10 g. Stearic Acid
3/12/00 — 30 g. Wood tar
20 g. Paraffin 120
1 g. $MgCO_3$

Brittle, — ~~Made lamp~~
~~Glycerine~~ N.g.

6) J-
3/12/00

40 g. Fluorate Soda 7.50
10 g. Stearic Acid
30 g. Mineral pitch
20 g. Paraffine 120
1 g. $MgCO_3$
Bottle

---

6) 6
3/12/00

40 g. Fluorate Soda 7.50
10 g. Stearic Acid
30 g. Burgundy pitch
20 g. Paraffin 120
1 g. $MgCO_3$
Fair - moist cong -

---

677 -
3/12/00

30 g. Fluorate Soda 7.50
10 g. Stearic acid
35 g. Mineral oil.
25 g. Paraffin 120
1 g. $MgCO_3$

Fair - does cut as good as 676

6) 8 - 3/12/00

30 g. Sucarate Soda). 80
10 g. Stearic Acid
35 g. Wood tar pitch
25 g. Paraffin 120
5 g. Mgco3
Brittle

---

6) 9 - 3/12/00

30 g. Sucarate Soda). 80
10 g. Stearic acid
35 g. Burgundy pitch
25 g. Paraffin 120
5 g. Mgco3
Fair - moisture Cangum

---

6 80 - 3/12/00

30 g. Sucarate Soda (6.6 5)
10 g. Stearic acid
35 g. Tar wg
25 g. Best ceresin
5 g. Mg co3
Hard, brittle, N. g.

681 30 g. Stearate Soda 6.65
3/17/00 10 g. Stearic Acid
35 g. ~~Mineral~~ tar patch
25 g. Beeh Cerium
5 g. $MgCO_3$

Hard, brush-n.g

682- 30 g. Stearate Soda 6.65
10 g. Stearic acid
3/17/00 35 g. Burgundy pitch
25 g. Beeh Cerium
5 g. $MgCO_3$

Brush-n. g. Inf.
manic Glomfe.

683- 25 g. Stearate Soda 6.65
3/17/00 5 g. Stearic acid.
~~Lithos~~ Rosin wg.
30 g/ ~~Paraffin~~ 120
5 g. $MgCO_3$
make large

Fair

684
3/13/00

25 g. Silicate Soda 6.6 S-
5 g. Silicic Acid
40 g. wood tar pitch
30 g. paraffine 120
5 g. Mg CO_3

Fair - Shavings not so dry

685
3/13/00

25 g. Silicate Soda 6.6 S-
5 g. Silicic acid
40 g. Burgundy pitch
30 g. paraffine 120
5 g. Mg CO_3

Fair - better than 684

686
3/13/00

25 g. Silicate Soda 6.6 S-
5 g. Silicic acid
40 g. rosin wg
30 g. PbO cerusse
5 g. Mg CO_3

Poor, brittle

687 — 3/13/00

25 g. Stearate Soda 6.6:1
5 g. Stearic acid
40 g. wood tar pitch
30 g. Bels cinnin
5 g. Mg CO_3
110 cc – Triple – n.g.

---

688 — 3/13/00

25 g. Stearate Soda 6.6:1
5 g. Stearic acid
40 g. Burgundy pitch
30 g. Bels cinnin
5 g. Mg CO_3
Brittle – gummy, tenacious

---

689 — 3/13/00

30 g. Mg resinate 100:1
20 g. paraffin 120
n.g. – doesn't melt cool – fair mix
between

690 — 3/13/00

30 g. Mg resinate 100:1
20 g. Bels cinnin
n.g. no mix – good.

691 10 g. Stearate Ca 100 : 8
15 g. Mg. Stearate 100 : 10
3/13/00 40 g. Rosin wg.
30 g. paraffin 120
5 g. Mg CO3
very hard yellow Soft-gummy

---

692 10 g. Stearate Ca 100 : 8
15 g. Mg Stearate 100 : 10
3/13/00 40 g. Wood tarpitch
30 g. paraffin 120
5 g. Mg CO3
pellets with yellowish very soft.

---

693 10 g. Stearate Ca 100 : 8
15 g. " Mg 100 : 10
3/13/00 40 g. Burgundy pitch
30 g. paraffin 120
5 g. Mg CO3
soft, sticky

694 10 g. Ca Stearate 100:8
15 g. Mg Stearate 100:10
3/13/00 40 g. Rosin wg
30 g. Beeswax
5 g. MgCO3 gummy.
M. & Sh. Mg face to enter.

---

695 20 g. Mg Stearate
10 g. Ca "
3/13/00 40 g. rosin wg
30 g. paraffin
5 g. Mg CO3
gummy, soft - very

---

696 20 g. Mg Stearate
10 g. Ca "
3/14/00 40 g. rosin wg
30 g. Beeswax
5 g. Mg CO3
Brittle - gummy.

4.60
.50
3.00
.60
6.70

697 20g Mg Stearate 100:10
58g. rosin
3/14/00 30g. paraffine 120
1g. Mg CO_3
Opr.

698 30g. Ca Stearate 100:8
50g. rosin wg
3/14/00 20g paraffine 120
1g. Mg CO_3
Juser fair

699 25g. Ca Stearate 100:8
1g. Stearate zinc 100:55
58g. rosin wg
3/14/00 20g. paraffine 120
1g. Mg CO_3
Not dry

Lot 700 — 899 see Book #2

#800 25 g. Stearate Soda 6.6 s
40 g. rosin wg.
3/14/00 30 g. paraffine 120
4 g. Mg Cos
720 ivory

#801 — 30 g. rosin. wg.
3/14/00 30 g paraffine 125
2 g. Mg Cos

---

802 700 c.c. Soda mc.
3/15/00 18° B
2 g. Al.
400 g. Stearic Acid

---

803 200 cc Soda mc.
3/16/00 18° B.
3 g. al.
400 g. Stearic Acid

8r4 200 gc Soda sol.
3/10/00 180 B.
4 g. Al.
400 g. Citric acid

8J5 140 c.c. Soda sol.
3/10/00 180 B.
4 g. Al.
Soft. Gummy s.g. 300 g. Citric acid
200 g. Mem wg.

8J6 – Marler cyl.
3/10/00 ~~440 g. Regnocer.~~
~~110 g. Sal soda~~
~~440 g. Acetate Soda~~
200 g. Sal Soda.

Mexicans Soda used in
807-808-809-811-812-813
814-816

700 gro. Steam Cans
1524 gr. Sal Soda

807
3/20/00
50 g. Steam Soda
300 g. B. pitch
20 g. paraffine 125-
5 g. Mg CO_3
no perceptible saponification
fair to ream etc

808
3/20/00
40 g. Steam Soda
35 g. rosin wg
25 g. paraffine 125-
5 g. Mg CO_3
no perceptible saponification
fair to ream etc

809 40 g. Stearat Soda
3/21/00 35 g. B. pitch
25 g. Paraffine
5 g. Mg CO_3
M. f. very soft - tablets
a pound 2 hrs to Lardeen

Mentho Cyl.

810. 600 g. Stearic Acid
3/27/00 240 g. Acetate Soda
40 g. Stearate Al.
120 g. Carnauba

811
3/21/00 40 g. Stearate Soda
35 g. Burgundy pitch
25 g. Beeswax
5 g. Mg CO_3

Very hard to mould.
takes a long time to harden.
Very gumming on flaming + edging and shaving

8/7. 30 g. Stearate Soda
40 g. rosin wax.
3/21/00 30 g. paraffin 125-
5 g. Mg CO_3

N. G.
Too long to harden

#813	30 g. Stearate Soda
3/21/00	40 g. wood Tar pitch
3/22/00	30 g. paraffine 12 s
	1 g. Mg CO_3
Can't mould	

#814	30 g. Stearate Soda
3/21/00	30 g. paraffine 12 s
3/22/00	40 g. Burg. Pitch
	1 g Mg CO_3

#815	30 g Stearate Ca 100%
3/22/00	15 g. rosin wg.
	30 g. paraffine 12 s
	1 g Mg CO_3

480
40
200
36
7.56

#816	40 g. Stearate Soda
3/22/00	35 g. Resinate Cu 200 : 5
	25 g paraffine 125
	3 g. Mg CO_3

alright on edger etc

#817	40 g. Stearate Soda
3/22/00	30 g. Resinate Cu 200 : 9
	30 g. paraffine 125
	3 g. Mg CO_3

pretty good on edger etc

#818	150%	#801
3/23/00	150%	#802

nice contraction
Stool first and then takes a long time to harden before being hard enough to take out of mould

819 60% #801
2/23/00 40% #803
See #818 - much harder to peel
middle - gummy.

820 70% #801
2/23/00 30% #802
See #819 Letter

821 [illegible]% #801
2/27/00 [illegible] Stamps al.
Paper had to mix. Will
not meet to Nomo. fund

822 50% #801
2/27/00 50% Regnocer
very gummy on edges etc

823 15% # 801
3/23/00 15% Bur. Pitch
Proof. 15% paraffine 12s-
25% St. Jun

824 68% # 802
3/23/00 24% rosin oil
Proof, 8% par. 12s-
Coarse grained

825- 68% # 802
3/23/00 24% B. pitch
Proof, 8% par. 12s-

826 68% # 802
3/23/00 24% wood tar pitch
Proof 8% par. 12s-

827 60% " 802
Mfg. 30% Rounding
7/27/00 Blacky 5% par. 12 s-

828 60% " 802
Mfg. 30% Dispatch
7/27/00 Blacky Cross 10% par. 12 s-

829 60% " 802
Mfg. 30% Rounding
7/27/00 20% par 12 s-

830 60% " 802
7/27/00 ~~Mfg.~~ 20% B. patch
20% par 12 s-

Father Mackenbrock

831 60% " 802
3/27/00 ~~70% 802~~ Wood Spruce
20% pran 12 J

832 ~~40%~~ " 802
3/27/00 30% Douglas Fir
20% pran. 12 J

833 ~~60%~~ " 802
3/27/00 ~~30% Douglas Fir~~ spruce
20% pran 12 J

834 ~~40%~~ " 802
3/27/00 30% W.R.C. P.
20% pran. 12 J

835 — 3/60/0 — # 802
3/23/00 — 4 8/0 Rosin wg
16 0/0 pa. 12 5

836 — 3/60/0 — # 802
3/23/00 — 4 8/0 B. pitch
16 0/0 pa. 12 5

837 — 3/60/0 — # 802
3/23/00 — 4 8/0 R. P.
16 0/0 pa. 12 5

838 — 4/60/0 — # 803
3/23/00 — 3 8/0 Rosin wg
16 0/0 pa. 12 5

839 [illegible] % #803
3/23/00 [illegible] J.B. Pitch
15-% [illegible] 12 J

840 [illegible] #803
3/23/00 [illegible] Rosin [illegible]
[illegible] Par 12 J

841 [illegible] #803
3/23/00 [illegible] J.B. Pitch
[illegible] 12 J

842 [illegible] #803
3/23/00 [illegible] W.P.
[illegible] 12 J

843 40% #803
3/23/00 30 Rosewing
25% fair 125

844 40% #803.
3/23/00 30 B. Pitch
25% fair 125

845 40% #803.
3/23/00 30 Rosewing
30% fair 125

846 40% #803
3/23/00 30 B. Pitch
30% fair 125

847 40% #803
3/27/00 30% W.J.P.
20% par 125

848 30% #803
3/27/00 30% Round Wing
30% par 125

849 30% #803
3/27/00 30% B. pitch
30% par 125

850 Hazel 9% #803
3/27/00 Dk. S. 9% Bowing
25% par 125

851 30% #803
3/27/00 30% Dk. Pitch
25% par 125

[illegible] - 815 - 816 - 818 - 822

879 - 854 - 855

#819 and "855 Part wet not as

bad as required

855-2 60% "Sou

3/28/00 30% Rowing

very gummy in [illegible] 10% Pa. 130

855-3 [illegible] 60% "Sou

3/28/00 30% Rowing

10% par 125

854 60% "Sou

3/28/00 20% Rowing

very gummy 20% par 125

855-Nei 60% "Sou

3/28/00 20% Rowing

20% par 125

very gummy in rowing

856 50% "Sou

3/28/00 35% Rowi

15% par 125

857 – 40 % # 8oz
3/28/00 200 % 14 J % Roun wq
15 % pour 12 J –

858 % 40 g. # 8oz
3/28/00 % 48 g. Roun wq
Marco 16 g. pour 12 J –

859 % 40 g. # 8oz
3/28/00 5 g. Roun wq
17 g pour 12 J –

860 40 g. # 8oz
3/28/00 54 g. Roundwq
18 g pour 12 J –

861 30 g. # 8oz
3/28/00 Roundwq
14 g pour 12 J –

862 — 31 g. #804
3/23/00 [illegible] g Rombwq
[illegible] spar 12 S —

863 30 g #804
3/23/00 [illegible] g Rombwq
11 g. spar 12 S —

864 [illegible] g #804
3/23/00 [illegible] g Rombwq
[illegible] g. spar 12 S —
2 g MgCO3

865 — 34 g #804
3/23/00 53 g Rombwq
11 g spar 12 S —
2 g MgCO3

866 32g # 804
2/23/00 Cow 32g Rovid-wq
11g prar 12 s -
4g mgCO3

867 30g # 804
2/23/00 ~~[illegible]~~ wq
hard 1g prar 12 s -
Glo 6g mgCO3

868 ~~[illegible]~~ # 804
2/23/00 ~~[illegible]~~ 52g Stan wq
7, 12g pa, 12 s -
8g mgCO3

870 - This solution was filtered - the material on the filter dissolved in alcohol and the alcohol evaporated off. The residue is resinous and black - sticky + soft.

869. Digested grease wood #4 with water
3/28/00

870 Digested grease wood #4 with hot water
3/28/00
The sol. becomes brown, and addition of acid the sol. first changes to green then to coffee + milk color and finally reddish which is poor nothing ~~of apparatus~~ our. The odor is strong resembling ~~[illegible]~~ burning rubber or hippuric acid

871 Digested grease wood #4 in ~~Soxhlet~~ Extractor with Chloroform for 3 hrs.
3/28/00
35 gm roots used.
10% or 3.6 g. of a resinous mass obtained.

pe # 899

872 - 3/29/00

Digested grease wood ~ 4 with milk of lime, for a period of 6 hours. Then filtered off the woody material, decomposed any lime salt and dissolved the excess of lime with HCl - then filtered. Dissolved the stuff on filter in alcohol + evaporated off the alcohol. The residue dark in color and similar to #870 but more fluid and sticky. After a period of 10 days - a crystalline mass appeared

873 - 7/29/00

Treat the stems - 20 g. of grease wood #4 with Chloroform in Soxhlet Extractor for 5 hours. The stems were well pounded in a porcelain mortar.

The residue after the Chloroform had been distilled off weighed 5.5 g. or 27.5%.
Dark in color - a heavy sticky resinous fluid.

Ale # 901

874- 8/30/00

Treated 200g skins of grease wool #4 in Soxhlet Extractor with Carbon bisulphide for 5 hours. The skins were well bruised in a porcelain mortar first. The residue after CS_2 had been distilled off weighed 3.1 g. W/5.69% Lighter in color than #3. Less fluid but sticky & resinous

#875 3/31/00

Treated 20 g. Stem, were bruised in porcelain mortar in Soxhlet Extractor with Ether for 4 hours. Then distilled off the ether. The residue weighed 4 gr. or 20%. The material has the general appearance of #873

F76 4/2/00

Treated 20 g. of stem of grease wood #4 - from New Mexico in Soxhlet Extractor with Benzol for 4 hours. The stems were well bruised. The Benzol solution was then evaporated and the residue weighed 3 g. or 15%. The general appearance like the others

see # 881

877 4/20/00

Boiled some were bruised stems of grease wood in alcoholic solution of NaOH in a flask connected with a return condenser for 3 hours. The liquid i.e. the alcoholic soda solution, has a very dark color and a pyridine like odor after filtering. The alcohol was evaporated off, the soda solution decomposed with 50% H_2SO_4 and the whole filtered through a paper filter. Everything appears to go through. The color and odor somewhat the same as #870. This liquid mass then heated with CS_2 in separating funnel — CS_2 evaporated off without separation + the which boiled with the water.

#878 4/1/00

Upon looking at #872 today there appeared to be a separation - one substance is black and sticky while the other appears to be a colorless oil. Warmed up this and then tried to filter off the black material by means of cheese cloth. This doesn't appear to take out the black matter. Thought that by dissolving it in alcohol and then filtering through paper might work but the black also dissolves. Upon evaporating off the alcohol the residue is a grayish white solid, when cooled it becomes dirty looking and mushy as if it had taken up moisture

4/7/00. The above has crystallized out in long radiating crystals

#879 4/2/00

Need to saponify #873 with Caustic soda. Saponification takes place - The resulting compound is a thick liquid dark in color.

880. 4/3/00

Treated 100 g. crushed grease wood - stem + roots - in hot milk of lime containing 100 g. lime for 8 hrs. Filtered through cheese cloth after decomposing with acid. A good strong squeezing was resorted to in order to squeeze through the cloth any oil or resin. A portion of this was treated in a flask connected with a return condenser with benzine. This separated in a separating funnel and the benzine evaporated. The residue was light in color small in amount and very sticky.

881 4/7/00

The material in #877 that had been subjected to extraction, being very mushy was boiled with water. Then filtered through paper filter. Treated to carbon bisulphide in separatory funnel. Nothing appeared to be extracted, however upon evaporating the carbon bisulphide there remained a very small quantity of light colored matter, greasy and paraffine like.

The water, carrying over the oil and after separating the oil requires 3.3 N Na_2CO_3 sol to neutralize or .1649 g Na_2CO_3 or .097 g Na_2O for 100 c.c. of the water distillate, showing presence of volatile acids.

See #900
#902

882 4/5/00

Distilled 50 g. crushed grease wood with water. Used about 1000 c.c. water. A small quantity of oil came over.

883 4/5/00

Distilled the same stem as in #882 with 5% volume H_2SO_4. Most of the oil comes over towards the end when the heat is raised, the oil is colored brownish.

1% volatile oil

#884 4/5/00

Digested 100 g. crushed stems of grass wood in a Soxhlet extractor à la Stengle with carbon bisulphide. Yield was 10 g. resinous matter, this was distilled alone per se, in a small porcelain retort. Apparently nothing distilled excepting traces of the solvent still contained in it. Upon evaporating the distillate, a substance similar in appearance to the original remained. The residue in retort had a very disagreeable odor but appears to be thicker consistency than original, black in color.

resembling the odor when fish + sawdust are distilled

Creosote

4/6/00

Bilitia, dry, 100 gr - crushed stems + roots of grain wood in iron retort with naked flame. A liquid came over smelling strongly of burnt wood and holding particles of carbon in suspension. This was filtered through thick cloth and then shaken with carbon bisulphide in separatory funnel - A black disagreeable smelling somewhat mellow towards oily liquid remains.

Probably all creosote

#88 4/7/00

Distilled the material that had been exhausted with CS_2 in an iron retort with naked flame.

A liquid similar to #85 - comes over. The carbon is filtered off and the filtrate treated with Ether in Separatory funnel.

a The residue after Ether evaporates is a dark-disagreeable pungent smelling oily liquid

b Then with Benzol.
Pure black - rather what like the first (a)

c Then with Chloroform
darker in color than Ether (a) thicker and not so strong smelling

d Then Benzine - nothing taken out.

e - Then CS_2

f - then gasoline

887 - Master cylinders
4/9/00 99% Reg
1% Carnauba

888
4/9/00 95% Reg
5% Carnauba

889
4/9/00 93% Reg
7% Carnauba

890
4/9/00 90% Reg.
10% Carnauba

891
4/9/00 85% Reg
15% Carnauba

892
4/9/00 75% Reg
25% Carnauba

893
4/9/00 75% Reg.
10% Carnauba
15% Spermaceti.

894
4/9/00 75% Reg
15% Carnauba
10% Spermaceti

895
4/9/00 65% Reg.
25% Carnauba
10% Spermaceti

896
4/9/00 75% Reg.
15% Carnauba
10% Stearic Acid

897 99% Reg
4/9/00 1% Manila Gum XXXX
The gum will not dissolve

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898 Grease Wood.
4/10/00 Placed 50 grs in Extractor moistened with NH4OH and then extracted with ether.
10% Extracted - The extracted material is very fragrant and more liquid & oily, not so resinous but sticky

899— Grease wood
4/1/00 Benzoic acid in it?

Dissolved the crystalline ppt at 8½
which I think is Benzoic acid
in water to recrystallize—

Took 1 oz. bruised stems and
treated them with slaked lime
by boiling

900. 4/10/00

Tested distillate - water - in 1st pop 3
with $BaCl_2$ - no ppt

Conc. the entire distillate by redistilling - if volatile acid is in it - it will readily be carried over with steam.

Then treated conc. distillate with following reagents - $CaCl_2$, $CuSO_4$, NH_4CNS, K_4FeCy_6, K_3FeCy_6, K_2CrO_4, $SnCl_2$, $(NH_4)_2C_2O_4$, NH_4Cl, Hg_2NO_3, $PtCl_4$, $U(C_2H_3O_2)_4$.

None gave a ppt in the cold.

In the hot, K_4FeCy_6, K_3FeCy_6 and Hg_2NO_3 gave a decided white ppt while the odor of prussic acid was noticeable in the two former.

901 4/10/00

Treated the extracted material obtained in #874 with the following solvents

a - alcohol - filtered off insol. portion. Then mixed it yeast. bid - a resinous solid - above.

b - Ether - Completely soluble - filtered through animal charcoal - no change

c - CS_2 - Completely soluble

d - Benzol - completely soluble

e - Benzine - very large

f - gasoline - very little

g - water - appearance, nothing

h - Kerosene - very little.

902 4/11/00

Treated the stem left after #883 with the following solvents ~~respectively~~. allowed each 1 hr.

903 - 4/11/00

Petroleum - nothing extracted

904 4/11/00

Gasoline - nothing extracted

905 - 4/11/00

Benzine. - Farce out a colourless oil which dries up upon standing exposed.

906 4/11/00

Alcohol - Colourless liquid resinous mass which upon standing separates into an oil and a resinous body.

907 - 4/11/00

Benzol.

Not so white as 906 but about ¼ the quantity and not so black

908 4/11/00
Carbon bisulphide -
Small quantity of light colored sticking mass which dries up to a gum like body

909 4/11/00
Ether
a substance that dries up to a sticky oily powder

910 - 4/11/00
Chloroform
Similar to #908 but not so gummy.

911 - 4/11/00

Acetic Ether.

Somewhat like in appearance #907 but more oily and yet unlike #906

912 4/11/00

Moistened with ammonia and then extracted with Ether.

The ether then extracts nic.

Special Cylinder for Urush

#913 - 240 gr Syrian Asphalt
4/17/00 18 g. Soda (caustic)
12 g Carnauba

#914 250 gr 5 carnauba
4/18/00 1 pt soda (caustic)
175 Syrian Asphalt
very brittle & Rara - Difficult to shave.

#915 95% #914
4/19/00 5% Paraffine

#916 95% 914
4/19/00 5% Ceresine

917 — 95% #914
4/19/00 — 5% Japan wax

---

918 — 90 pts Syrian Asphalt
4/19/00 — 100 pts Carnauba
3 pts Caustic Soda

very thick - not as thick as #914

gives good [illegible] finish

---

919 — 90 pts Syrian Asphalt
4/20/00 — 150 pts Carnauba
3 pts Caustic Soda

920 200 pts Carnauba
4/20/00 100 pts Syrian Asphalt
10 pts par. 130

---

921 100 pts Carnauba
4/20/00 100 pts Syrian Asphalt
20 pts par 130

---

922 100 pts Carnauba
4/20/00 150 pts Syrian Asphalt
20 pts paraffine 130
sticks to mould when pressed

923 - 4/20/00
100 pts Carnauba
200 pts Syrian asphalt
25 pts paraffin/30

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924 4/24/00
30 pts Syrian Asphalt
1 pt Caustic Soda
40 pts Carnauba

---

925 4/24/00
30 pts Syrian Asphalt
1 pt. Caustic Soda
60 pts Carnauba

926 30 pts Syrian Asphalt
4/24/00 1 pt Caustic Soda
70 pts Carnauba

---

927 30 pts Syrian Asphalt
4/24/00 2 Caustic Soda
40 Carnauba

Meaner Cinch 700 pts
Orion 157 pts
Week in Oct -929 - 930.

Cheap Max

1928 70 pts [illegible]
7/00 3 " [illegible]
1 " Ammonia
20 " [illegible] wg
10 " Paraffine

929 70 pts Bleach [illegible]
7/00 3 " [illegible]
1 " Ammonia
1 " [illegible]
20 " [illegible] wg
10 " Paraffine

#930 - 40 Bicarb Soda

5/7/00 31 " Ros. Ca. 200:10

237 paraffine

2 " Magcos

---

931 added Paraffine to

5/17/00 a ~~Nodophthalm~~ solution

of urinate of iron. The

did as expected - threw

out the urinate of iron.

and would not dissolve

in it or with it.

932
5/14/00 added flowers of sulphur to a mixture of Nitric acid and W. W. rain
the sulphur dissolves but the mixture is a 70 of 1 strength

933
5/14/00 added flowers of sulphur to ~~a mixture of Nitric~~ melted rock w. w.
Any amount of sulphur goes in - see #937 etc

934
5/14/00 Added 3 grams of sulphur to Naphthalin.

No action whatever

935
5/14/00 Sulphur to Stearate of Soda 700:154

Action very slow and scarcely 1% was absorbed during the entire afternoon

936
5/14/00 Sulphur to Resinoid.

The note under #935 applies here. In both cases the color became quite dark.

937
5/15/00 Zosin with various % of Sulphur.

100% Sulphur
50% "
15% "
20 " "
25 " "
30 " "
35 " "
40 " "
45 " "

Sticky

bad

-N.g.

938
5/15/00 Burgundy pitch & sulphur.

Stick.

939
5/16/00 Sulphur & paraffin
5% Sulphur
10 %

The sulphur shows crescent but the remaining compound is indifferent to permanganate of iron in both cases.

940 Sulphur & Creosote
5/16/00 5% Sulphur
10%

The sulphur and creosote of these are indifferent in both cases.

---

941 Sulphur & H_2O creosote
5/16/00 5% Sulphur
5/17/00 10%
15%
20%
25%
30%

Sulphur does not chemically combine.

H. Comey, run upon standard

942
5/17/00 50% #937-31%
50% Stearate Soda 100.1 lbs

943
5/17/00 ~~40~~50% #937-31%
~~40~~50% Stearate Soda 100.1 lbs

944 40% #937 - 35-
5/17/00 60% Stearate Soda.

945 5g. remnants of iron
5/17/00 added to #941 - 10%

The sulphur comes
out upon standing

946
5/17/00 10 g Humate iron added #941 - 17%.

Fe = 945

947
5/17/00 15 g Humate iron added to #941 - 20%.

Fe = 945

P48
5/18/00 Castor oil + sulphur.

The oil darkens in color but other wise there is no change.

P49
5/18/00 Linseed oil + sulphur

darker, apparently no chemical reaction.

950
5/18/00 Oleic acid + sulphur
Aida Carter + Chester

951
5/18/00 Cottonseed oil + sulphur

No Change, oil has in suspension golden crystals which resemble sulphur.

952
5/18/00 Mixt + liver of sulphur

Black - about the
same as with p-Cresol
sulphide

953
5/18/00 Mixt + Sodium potas
sulphide.

Very hard to react
+ very slow if any reaction,
otherwise same as #952

954 Syrian Asphalt & Sulphur
5/18/00

The Syrian asphalt has most too high a melting point although the sulphur apparently melts. See # 958

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955 Syrian Asphalt & lower
5/18/00 of sulphur

See # 954 then
#959

956 Syrian Asphalt &
5/18/00 Sodium pentasulphide

See # 957

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957 Rosin oil & sulphur
5/18/00

Oil much thicker
and no rosin smell at
all. - darker

958
5/18/00 50 pts Syrian Asphalt
50 pts Carnauba
5 pts Sulphur.

Melting point [illegible]

959
5/18/00 50 pts Syrian Asphalt
50 pts Carnauba
5 pts liver Sulphur

[illegible] Charnigan

960
5/18/00 75 pts Carnauba
50 pts Spirit Asphalt
5 pts Resins

---

961 linseed oil + lines of
5/19/00 Nephus

Stiffer than "949 otherwise
Muchouspa

962 linseed oil + sodium
1/19/00 pentachlorphenate

See # 961

963 Castor oil + linseed oil
1/19/00 sulphur

No difference from
948

964 Castor oil + Sodium pluta
1/19/00 Sulphide

No reaction.

---

965 Rosin oil + Excess of
1/19/00 Sulphur

Thicker than #957

966 Rosin oil + Sodium
5/19/00 penta sulphide

No Change

---

967 Cotton seed oil
5/19/00 + Oil of Turpentine

No Change

Cylinders for wood

968. 90 pts Syrian Asphalt
12/00 100 pts carnauba
3 " caustic soda
5 " paraffin

969
90 pts Syrian Asphalt
12/00 100 " carnauba
3 " caustic soda
5 " stearic acid

970 — 90 pts Syrian Asphalt
7/21/00 100 " Carnauba
3 " Caustic Soda
20 " Fleurat Soda 100:150

Cheap. Wax

971 — 90 pts Syrian Asphalt
7/21/00 10 " paraffine
5 " Sulphur.

The asphalt + paraffin will not mix before the melting point of the asphalt is reached - the paraffine volatilizes and what little is combined is unfilled by the S.

972 50 pts Syrian Asphalt
1/21/00 50 pts paraffine
5 " lines of Sulphur

See # 971

---

973 50 pts Syrian Asphalt
1/21/00 50 " paraffine
5 " Sodium Para Sulphide

See # 971

974 50 pks Bitumen
5/21/00 50 pks paraffine
J. H. Sheppard

975 400 g. Cuppowrow

5/22/00 Stearate Soda 70:12

a- 40 The paste was thick

b- 80 the mixture cooled before

c- 120 coagulating

d- 160

e- 200

f- 20 g Stearate Alumina

g- 10 g. paraffine.

e - d - c - f and g break

i melted to be more sticky

than others

976 400 g. [illegible]
5/22/00 [illegible]

a - 20 g
b - 40 g
c - 60 g.

---

d - 20 g Mg Silicate 100:10
e = 20 g. Carnauba
f = 20 g. Syrian Asphalt
g = 5 g Cantil Indo.

---

d - e - f and g are
[illegible]

977 400 g Copperwaxx
1/27/00 Cerecine White.

a - 20
b - 40 - not homogeneous
c - 60

d - 20 g Hematite Zinc
very frothy
e - 30 g Hematite Zinc 100:88
f 10 g Carnauba

c - e and f are best
but a trifle too soft

978 400 g Cyphorotrin
J 27/00 BCK Cerasine
40
60

BCK cerasine is n. g to be used – the Cyphorotrin MHeg being mixed to froth also the BCK cerasine – the resulting mixture is too large froth Hence must leave BCK cerasine out entirely

979 400 g. cpp-pneurosin
5/27/00 Regnocer

a = 40 g.
b = 80 g.
c = 120 g
d - 160 g.
e - 200 g.
f = 240 g.

980 300 g Copper-[illegible]
1/11/00 150 g Oleate Soda 700.15 g
Oleate zinc

a 20 g
b = 40 g
c = 60 g
d = 80 g

T melting

#981 with Oppiowotom the resulting mixture about the same cutting time and shaving appearance as - but becoming sticky if allowed to remain in the fingers - the wax is somewhat brittle and at times tenacious, depending upon the temperature - a slight increase of temperature causing stickiness.

#982 - #981 are a few that appear

981
Stripe
Oppiowotom
Pat - 4092 -
t = 82
C = 120°
d - 1695
e = 2000
f = 2000

best but with the faults mentioned above. Cylinders will be made and a test given them for scratching tissues.

An attempt will be made to overcome this liability to change with any change of temperature by working with different gums, like Al. mastic & Sharats Soda and Copperoin will be used as base as that mixture has a fine melting point.

Feb 22 400 g. Copperoin
1/22/00 120 g. Sharatt Soda 700:1.5%

Feb 3 400 g. Copperoin
1/31/00 100 g. Sharatt Soda 700:1.5%

Acid has been added to Lard. Have the [illegible]
If the lard [illegible] Cottonseed
Above 150 °C. [illegible] Cottonseed [illegible]
Accompanied [illegible] Molecular [illegible]
Above [illegible] H_2S [illegible]
Bacteriums [illegible] Carbon Acid [illegible]
Volatile [illegible]

984 400 g. Cottonwaxen
1/27/00 200 g. Alkali Soda 100:154

985 400 g. Cottonwaxen
1/24/00 100 g. paraffin
20 g. Alkali Mg. 100 : 10
20 g. Carnauba

986 400 g. Oppponrosin
100 g. paraffin
1/24/00 20 g. Mastiarali 100 : 10
20 g. Carnauba
20 g. Syrian Aspiart

987 400 g. Oppponrosin
40 g. White Ceresin
1/24/00

988 400 g. Copper sulphate
60 g. White cement
5/24/00.

989 400 g. Copper sulphate
60 g. White cement
5/24/00 20 g. Hematite iron

990 400 g. cupriowolin
1/24/00 60 g. robitc acetate
20 g. sesquiate iron
20 g. Oleate zinc 100:55

991 400 g. cupriowolin
1/24/00 60 g. robitc acetate
20 g. sesquiate iron
20 g. Oleate zinc 100:55
40 g. carnauba

Too much fat
impossible to mix without

792

100 pts < 400 pts Cp [illegible]
120 " Alcanto Poda

[illegible] pts Gum Arabic

Not completely [illegible]

793

100 pts < 400 g Cp [illegible]
120 " Alcanto Poda

400 a - 5 " Gum Tragacanth
b - 10 " " "

994 100 pts < 400 g Chlorpromazine
120 g Sodium Sulfa
Pat/00 a - 5 pts from Tacamahac
b - 10 " "

995 100 pts < 400 g Chlorpromazine
120 g Sodium Sulfa
Pat/00 5 " from Anchusa

96
24/00 100 pcs 400 g Chlorhydrosa
120 g Stearic Acid

5 pt. Gum Myrrh

97
24/00 100 pcs 400 g Chlorhydrosa
120 Stearic Acid

5 pt. Gum [illegible]

198
1/15/00

100 pts. [illegible]

5 [illegible]

very funky.

199
1/21/00

100 pts. [illegible]

5 [illegible]

For continuation
see N 00/F35

Notebook, N-00-05-25

1900

Phonograph Cylinders

Book "H" 7.

John Calvin Shugle

1000
5/25/00

100 pts < 400 pts Cyprpanorari
120 Sleeping Suds

5 pts Gum Benzoin

1001
5/25/00.

100 pts < 400 Cyprpanorari
120 Sleeping Suds

5 pts Gum Opopanax

Not completed; microbes

glassy.

1002
5/21/00

100 pts < 400 Cp/p pwurrain
120 Bicarb Soda

5 pts Gum Senegal

does not dissolve just swells up.

1003
5/21/00

100 pts < 400 cp/p pwurrain
120 Bicarb Soda

5 " Bonair Aloes

1004
5/25/00

100 pts < 400 [illegible]
120 [illegible]

5 " Jim Albanese

1005
5/25/00

100 pts < 400 [illegible]
120 [illegible]

a - 5 " Jim Martin

b - 10 " " "

1006 100 pts < 400 Oppenheimer
5/25/00 120 Steamship Lodge

a. 5 pts Ammo

b. 10 " "

Glassy.

1007 100 pts < 400 Oppenheimer
5/25/00 120 Steamship Lodge

[illegible]

1008
5/25/00

100 pls < 400 pls Oppenheimer
120 Separate Folio

5 pls Juan Sagaseme

1009
5/25/00

100 pls < 400 Oppenheimer
120 Separate Folio

5 pls Jim Kirio

1010
5/25/00 100 pts < 400 Copaiferin
120 Stearate Soda

5 pts Gum Acacia

Does not dissolve but changes
mucilage.

1011
5/25/00 100 pts < 400 Copaiferin
120 Stearate Soda

5 pts Gum Acanthida

1012
5/24/00 100 pts < 400 [illegible]
120 [illegible]

5 pts [illegible]

1013
5/25/00 100 pts < 400 [illegible]
120 [illegible]

5 pts [illegible] Sanguis [illegible]

1014 1.00 < 400 cyanamide
120 Stearate Soda.
5/25/00

5 pts Gum Amalgam

1015
5/25/00 1.00 < 400 cyanamide
120 Stearate Soda

5 pts Gum Acacia

does not dissolve but swells
a little [illegible]

10.16

5/25/00 100 pcs < 400 Peppermint
125.00 Bicarbonate Soda

5 pcs - [illegible]

[illegible]

10.17

5/25/00 100 pcs 100 [illegible] mints
[illegible] Bicarbonate Soda

5 pcs [illegible]

[illegible] Stickey

1015
5/20/00 100 p.c. [illegible]

5 pts Contract acc

[illegible]

1019
5/22/00 100 p.c. [illegible]

6 pts Room acc

[illegible]

1020
5/25/00 100 pts < 400 Copper
< 120 Atlantic Soda

[illegible]

Jeff Sticky

1021
5/25/00 100 pts < 400 Copper
< 120 Atlantic Soda

5 pts [illegible]

Jeff Sticky

1022
5/28/00

100 pcs < 400 @ approximate
120 [illegible] Sock

5 pcs paraffine

Joff Stickey

1073
Spring

[illegible]

5%
10%
15%

The asphalt goes in very slowly and not completely with sticky and not as hard as plain mix

1:4

[illegible] proportion [illegible]

[illegible] S.

5%
10%

The asphalt melts and after raising temp, slowly goes in but not completely
Still sticky but not as bad as plain rosin

1025
5/31/00 Based up #1023 - 15% soft
Trinidad Asphalt with
Sulphur

5% - Temp. must be kept
down to decomposition point - Sticky

10%

15% - Sticky.

These mixtures to fill with the with
plain mix

See #1028

1026

5/31/00 Fixed up 1024 - 10%

Hard Mexican Raspberries

with Raspberries

5% Temp must be kept above 15 degrees to prevent froth - sticky - broth will harden than 1026

10%

15%

more inclined to crush than plain mill

[illegible]

[illegible] NO_2 accompanied [illegible] finishing [illegible] grounds, [illegible] it impossible.

#1027 & #1028 afterwards settled down to a smooth surface

1027

[illegible]

[illegible]

Cuban Copper [illegible]

[illegible]

Hen	5% Sulphur little [illegible]
Hen	
	5% Cuban more
"	5% Sulphur
	5% Cuban
6/20/00 -	5% Sulphur
6/20/00 -	5% Cuban
6/21/00	HNO_3
	20 pts Sulphur
	20 " Sulphur

1028

6/1/00 Continuation of #1025
doing with various things

5% Cuban Asphalt
5% Sulphur
5% Cuban Asphalt
6/2/00 5% Sulphur
6/4/00 5% Cuban Asphalt
5% Sulphur
6/5/00 HNO_3
20 pts Sulphur
20 " Sulphur

[illegible] Prince Henri [illegible] Hardenberg-Hoolang

1029

6/4/00 10 pts Rosin wq.

10 " Prussic Chlorin Acetones

10 pts Sulphur

10 pts Sulphur

10 pts Sulphur

10 " Prussic [illegible]

6/5/00 HNO_3 -

One big [illegible]

[illegible] bubbles

1030	100 pts rosin wg
6/4/00	300 " prime Cuban Asphalt
	10 pts Sulphur
6/5/00	30 " "
	40 " "
	40 " "
	40 " "

N. G. Too much asphalt had melting point and full of air holes –

Too much Sulphur + asphalt →

1031

6/5/00 200 ~~gm~~ rain wq

20 c.c. Sulphuric acid

6/6/00 100 g. Sulphur

50 " "

50 " "

50 " "

6/7/00 50 " "

50 " "

6/7/00 25 g. Cuban Asphalt

25 g. Cuban Asphalt

6/8/00 50 g. Rosin wq

1032

6/5/00 200 pts rain wq.

30 c.c. HNO_3

6/6/00 50 g. sulphur.

N. G.

Nothing this

Joseph

1033.

6/13-14/00 Electrolysis of Sodium Formate.

In alkaline sol.

a - acid deposited on positive pole

b - " remaining in sol.

In water solution

a - acid deposited on positive pole

b - " remaining in sol.

1034
6/13-14/00

Partial Saponification of Wax

a - first portion acids

b - second " acids

1035
6/18/00 10 pts rosin
2 " " Sulphur

The above was intimately mixed then placed in hard glass tube and sealed – heated to a temperature of 150 °C for 3 hrs

The proportion of sulphur too great – there being a large excess. The sulphurated rosin being entirely different from that made in pan, this being transparent & more sticky & softer –

1036

6/19/00 25 pts rosin
10 Cubon Disulphide
5 Sulphur.

Intimately mixed & heated
in sealed tube for 3 hrs
at temperature of 150° C
This was raised to 180°–190° C
when explosion occurred.

1037
6/19/00 25 pts room
5 " Sulphur

Heated for 6 hours at temperature of 150 – 160° C. No difference from #1035. Nice attempt to raise temperature. First one blew up at temperature of 180° C. Today 6/20/00 safe but did not get above 170° C at any one time.

1038

6/20/00 rosin &

zinc chloride heated in
sealed at temperature of
150 - 160° C for 6 hours.

A change takes place, the
general appearance resembles
wood tar pitch but it is very
sticky and is about half
way between rosin oil &
rosin.

rosin & zinc chloride in
various proportions in
pan - same as above - dissolve
out zinc with water - residue
sticky

1039
6/2/10

Rosin + other HCl in

Sealed tubes.

Jane
MS

1040

6/21/00 Stain + dilute H_2NO_3

in sealed tube

Gone up

1041

6/21/00 Warm & dilute H_2O_2

in Sealed Tube

Jane

1042
6/23-25/00

Chlorinated Naphthalene and sodium formate in sealed tube. Kept at temp 140 - 150 °C. for 7 hrs. The mass has a homogeneous appearance darker in color and rather fluid.

1043
6/25/00
123

Chlorinated Naphthalene
and sodium stearate
in sealed tube - soft
grey compound resulted
after heating for 7 hrs at
140° - 150° C.

10/25/00

1044.

Oleic acid treated with HCl gas and sulphate soda in sealed tube ~~Heated~~ for 7 hours in heated at temperature of 140°–150° C. – Soft, greasy mass.

1045-
6/25/00

50pls Stearate Soda

50pls moistened with 2 gals.

This is not sticky apparently
but soft - now to harden up.

Notebook, N-03-10-09

Oct. 9/03

10/1000 Soft Rubber Edge diaphragm
alum Center 3/1000 thick

Oct 17/03

5/1000 Rubber Edge aluminum Center 3/1000 thick
Soft

1/10" wide 20/1000 40/1000 50/1000 50/1000

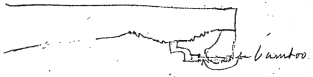
Oct 18/03

5/1000 Soft Rubber Edge alum Center 3/1000

1/10" wide 15/1000 50/1000 50/1000 50/1000 thick

Oct 19/03

Groove Soft Rubber edge Groove alum center



10" wide 20/1000 thick

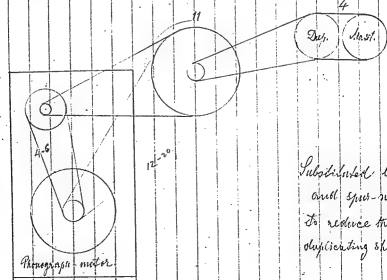
Oct 20/03

Notebook, N-05-08-15.2

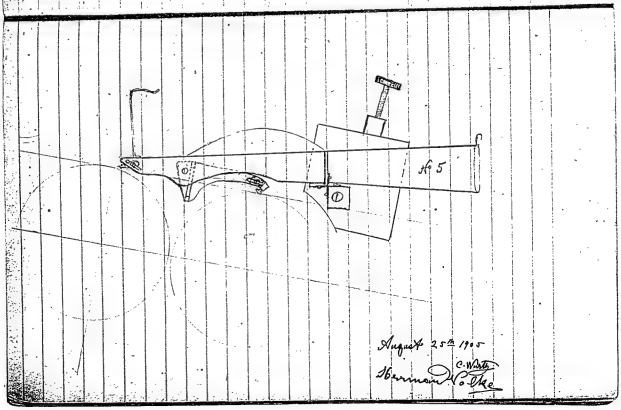
Room 18 S.O. # 1706

C. Wurth

August 15. 1905



Substituted belts for worms and spur-wheels —
To reduce the speed of the duplicating shaft to 4 p.m.


№ 5
Андреев 25 ⅱ 1905
С. Witte
Николай

Sept. 22. 05

C.W.
A.D.P.

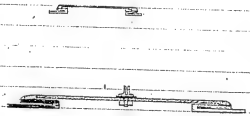
December 14th 1901

Charles W. Phillips

January 12th 1906

Make rubber=packing rings more flexible.

C.W.



February 06.

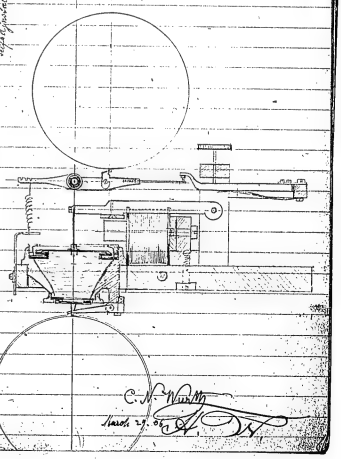
Prolong the life of masters by applying ice-water on the reproducer-ball for duplicating

C.W.

March 29th 1906.

Brough experiment with Electro-magnetic appliance in combination with hydraulic Emplicator

Not drawn enough! [illegible] not [illegible] [illegible]



C. N. Wright

March 29. 06

May 16. 06.

B. Diaphr. Drumhead skin 5/16 Diam. .08 thick
Horn #6. Stylus .010

B.1. Sound entrance in centre. rubber-cushions.
B.2. " " ⊙ cushion-bearing 1/16 thick
B.3. " " ⊙ " " "

June 1. 06

C. Diaphr. Parchement .008. Diam. 5/8"
Rec. Stylus .027. Rej. .025

C.1. Diaphr. Top. #2 ⊙ Diaphr. loose
~~C.2.~~ " " ~~3~~ ⊙ " stretched tight
(6/6) C.3.a.b. " " " " " loosened a little
C.3.c. " " 4 ⊙ " "
C.4.a " " " 3 ⊙ quite loose 1/16 bearing cushion
" b. " " " 1 ⊙ " " rubber cushion
C.5 " " 2 Diaphr. tightened slightly.
a. D.horn. 8 #6 hrn.
C.6 Diaphr. Banjo-head skin .007 hrn. #6.
a slightly loose, & b. stretched
C.7 id a Toy horn. B #6 horn. Very slightly stretched
C.2. Diaphr. Parchement .006 Steel stylus. stretched slightly
Diaph. top. #4

June 21st 1896

D. 1 Diaphr. Banjo-head skin .0075, 1,350" Diam.
Soundhole on one side I

Diaph. tight.

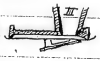
June 22.

D. 2 a. The same with soundhole at II

Soundhole II

D. 2. Sound hole at IV

D3 Soundhole III
a loose, b. Slightly tight.



D5 a. Toy-horn, b. #6 horn.
Soundhole #2 Stylus #385 Diaph. stretched

D. 6. Horn #6 Soundhole in centre, slightly tight.

D7 " Soundhole #II, more shallow
Diaph. stretched. OK

D. 8 " " #2. a little loose
" 9 " " " stretched more } stylus fast. low.
" 10 " " " a little less stylus high
" 11 Stylus a little higher than D. x. 9.

June 29th 06.

F. 2 Diaphs. Celluloid .011 corrugated disp.

in centre, shallow ~~~~~~~~~~

towards circumference. Soundhole # IV

a. #6 horn b. Toy-horn? N. 9.

July 10. 06.

Diaphs of Footmor-cloth and pine-wood 1 5/8" Diam

with ~~tightening~~ arrangement and spring to pull up.

F. 1. Diaphs and spring tight

2. Diaphs a little loose spring tight N. 9

July 20. 06.

Speaker with air-cushion in place of weight

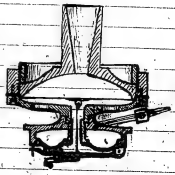
Diaphs. Banjo-head skin 1.550 (ins) Diameter

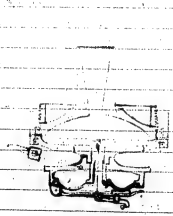
July 26. 06.

Replaced skin diaphs

by .005 steel.

reg. diam. O.K.

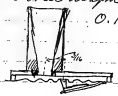




August 1. 06

Made recorder with .003 steel diaph.

sound-hole eccentric 3/16 O.K.



August 2d 06

Recorder with .003 steel diaph.

sound-hole eccentric 3/8 O.K.

stylus pastured on 3 legs

August 10. 06.

Automatic recorder with steel diaph., .003

bleached on both sides. not very loud

Automatic recorder with .001 nickel diaph.

C.11. very sensitiv. blasts a little

Sound hole 3/8 eccentric

August 17. 06. Automatic recorder

with diaph. of soft white-pine, .013 thick

bleached on both sides.

without rib across the grain of blasto

with rib has good tone, but less loud

C. 13.

1906

Sept. 10th to 24.
Took records on Pleasing-Tone in Room 13 (31)
with automatic Diaphs. .005 Steel.
Rivers overtune: E 1.
Sept. 15. Sent Shotom Recorder with No. Steel Diaphs. to W. Miller.
" 28. gave the arm of Stat. Rec. "

Sept. 28. 1906.
Diaphragm of .006 Charcoal-iron
filed down to .004 towards the edge
Reflectoholder a small post a little out of
centre of Diaphs. Reflec .010. O.K.

Oct. 10. & 11. Experiments with Five horns
" " 17. 2 Larks. Steel Diaphs. .003, Refl. .040. (Same as Shotom)
large 54" black horn and split papes horn.
high notes good, bass weak
Oct 17. Tyrol Nightingale. C. 17. Diaphs of Drawbaum Mass
with Shotom, large 44" paper horn.

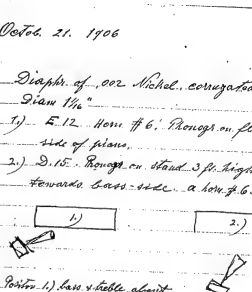
Oct. 19. Sent to W. Miller 2 = .010 Refl. 4 = .012 Refl.
1 = .015 " 1 = .010 Ball
2 = .030.

Octob. 21. 1906

Diaphr. of .002 Nickel corrugated, Stylus 35
Diam 1/16"

1.) E.12. Horn #6. Phonogr. on floor on treble side of piano.

2.) D.15. Phonogr. on stand 3 ft. high, pointed towards bass-side. a horn #6. b horn #10 (a.o.)

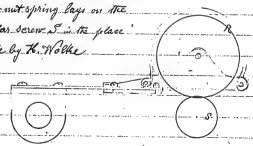


Position 1.) bass & treble almost the same intensity.
2.) treble notes much more penetrating.
No difference between 1/8 and 3/8 hole in diaphr. tip.

Oct. 24 – 27. Diaphr. of telephone-carbon on regular size OK. 1/16" tone too thin & metallic.

Nov. 1–6. 06. Diaphr. of .002 Nickel mounted in automatic & recording arm with leading ball reproduces. Diaphr. .002 steel. Reproduces faintest deviation very clear. In commercial phonogr. without leading ball there is too much scratch.

Novemb. 13. 06. Device for reproducing 100 thread records on Monie-phonograph with 100 thread-screw.
A Roller R mounted on the feed-nut spring lays on the regular screw S in its place.
Made by H. Wölke



of the feed nut. On this roller is cut a left hand screw-thread 100 threads per inch. The diameter of this roller must be double that of the screw.

Explained to me November 17. 1906.
Frank L. Dyer
Frank L.

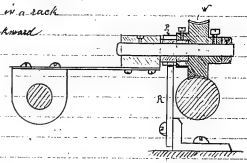
Novemb. 11 — 06.

Device for recording and reproducing 200 tracks records on Phonographs with the regular 100 screw

A worm 3/4" Diam. with a pinion 3/4" D.

engaging in a rack

moves backward



Mod. by C. Kirby

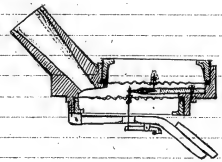
A worm 3/4" Diam. a gear-wheel of exactly the same pitch-line Diam. 48 pitch 20 teeth, an idler of any convenient Diam. a rack with 42 pitch

moves forward 200 rev. per inch.

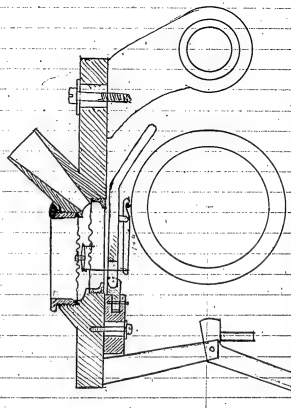
Dec. 1906 No. # 1887

Experimenting on multiple diaphragms for Reproducers

Dec 6.

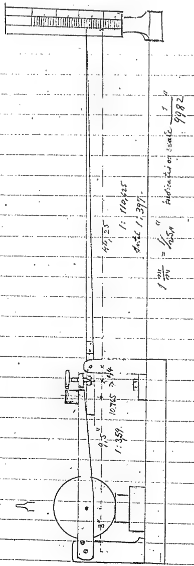


Dec. 31st 1906.



January 1907 to May 1907

Experiments on loud reproducers



Weights	#1) 3 oz	230 gr.	on End of Lever	12 oz 288 gr
	2) 4 "	100 "	" "	15 oz 79 "
	3) 5 "	350 "	" "	20 " 272 "
	4) 12 "	—		43 "
				(=2 lbs 11 oz)

1907. May–June S.O. # 1925

Hard-Wax Experiments

Regular black master Wax.

~~alone no weight~~

0	15.2 m/m on scale	
W.#3	23	at 9.30 AM
	24	" 31
	25	" 32
	25.5	" 33
	25.75	" 34
	26.25	" 40

Reg Wx with 10% Lamp-black ground in for 2 hs.

0 —	46 m/m on scale	
W#3.	9.47 AM	54
	48	55¼
	50	56.1
	52	56⅓
	9.57	57¼

17% Lamp-black.

(no weight) 0 —	28
#3 Weight 10.2 oclk.	33½
10.4	35¼
10.6	35¾
10.12 AM	36¾

25% Lamp-black

0 —	28
W. 10.14 AM	35
18	36¾
20	37⅓
10.26	38⅓

33% Lampblack

0 —	28
W. 10.32 AM	34
" 34	36
" 36	36⅓
10.42	37
10.45	37¼

50% Lampblack

0 —	29 m/m
with W. at 10.48 AM	35
" 50	37
" 53	38¼
" 58	39
11.15	40

June 10-11 '07

7 A) 66% dark Carnauba wax 12% light carnauba 12% lamp black

0. 22 73° 0-15

(1+3) W	27.5 (min)	4.28 (time)	W+3	16.75	4:42
	30.25	4.30		17 =	" 43
	31 =	" 32		17.25	" 45
	31.5	" 35		18	" 52
	32	" 38			

8 A 75.9% Light Carnauba, 15.8% white master wax and 10.3% Prussian blue

73°

Weights #1 & 3.

0. 27, 25 (min)

W. 1&3	37.5	5.10
	38	5.11
	38.75	5.12
	39.25	5.14
	39.75	5.16
	40.25	5.20
	41 =	5.22

9 A.) L. Carnauba 16. Sum Copal 17 P. Blue 25% W. not mix

N.G.

10 N. G.

11 A Reg. bl. Wx 25% Carnauba 50% Black 25%

N.G. Porous.

12 A Reg. Wx 25% Carnauba 50% Vienna lime 25%

N.G. Porous.

1) Stearic acid 10 drts. Acetate of lead 2½ drts.

2) St. ac. 8 drts. Ac. iron 1 dri not hard

3) " 6 " " ½ " not hard

4) St. ac. 8, Camauba 4, Ac. iron 1

5) St. ac. 8 Camauba 4

6.) " 8 " " Acet. cupr. 1

7.) 6 3 Arsenic ½ I, II, III

8.) " rosin " 3 " Aluminium 3 I II III

9 " 6 " " 1½ no crystals

10. " 10 " 0 Acet. Aluminium 2½ I, II

11.) " 12 " 0 Zinc ½ I II

12. " 18 " 0 Acet. Magnesia I II III

13.) " 4 " 1 mixed with # 12. II

14.) " 13 0 Acet. copper 3 I II

15) " 8 " " Lithium

16.) 20 " nickel 5

17 cobalt

18 Sep. + brittle. 7 I not hard but brittle

19

20 " 12 1 Acet. Magnes. Acet. Iron ½

21) 20 Stearic Ac. 10 D. Canauba 2½ Acet. Magnes.
Acet. St. Ac. 4 Acet. Magn. first. Stir add Can.
cracks in molding not very hard

22.) 15 St. Ac. 2 Acet. of Magnes. 1 Ac. of iron
add # 16 reg. Bl. mass. ½

23.) St. Ac, Acet. Magnes, Carocin, red gum I

24.) Stearate of Magnesium + gum copal

25.) " " " Shellack

26.) 20 Stear. Ac. 3 Acet. Magnes. 6½ Shellack

27 10 " 1 " " ½ "

28. 5 " ½ " " Gum Amber. (Was not dissolve)

29. " " " " " Gum Sandarac

30. 8 St. Acid. (Recovin) 1 Acet. Magnes. Gum Damour

31.) " " " Gum arabic was not dissolve

32.) 10 Stearic 1½ Acet. Lead + Syrian Asphalt will not come of mould

June 21. 07

W.2 N 3	80°			80°	
# 27	0	19.25	# 13	0	17
+W. 10	24	27 –		10.55	43.5
" 25		29		56	46.5
" 26		30.5		57	47.75
" 27		31.25		58	48.5
" 28		31.75		59	49 –
" 30		32.50		11.01	50
" 32		33		3	50.3
" 36		34		7	51
W.		29 (5)	–W		46.75 (4.25)

Reg. M. Wh. with 17 % Lamp black			Pt. of Barium		
0	–	25.75	0		21
+W. 11.15		42.50	+W. 11.34		33
" 16		45 –	" 35		37.75
" 17		46.50	" 36		39.50
" 18		47.50	" 37		41.50
" 19		48 –	38		42.25
21		49 –	40		43.50
23		49.50	42		44.50
27		50.50	46		46 –
–W		44 (6.50)	–W		41.50 (4.50)

June 22. 07

(# 33.) Stearin No. 10 Acet. Lead 2 Phosphor 2 Pum. Copal
(Pulverized) Pure copal will not dissolve.

34. Stearin No. 8 Acet. Lead 2 Phosphor 2

35 St. No. 8 Acet. Magnesia 1½ Phosphor. 3
D. Carmanbon 3.

(June 24) # 36.) St. No. 9 Acet. Magnesia 2 Sulph. 1 Carmanb. 1½
Hard but very brittle. Sandy.

June 25 # 37 Stear. Acid 9 Acet. Cobalt 2 Very foggy

38 Stear. Acid 8 Acet. Cobalt 1½ Carmanbon 1 Crescent

27) " 39. " " 8 " " 1½ Phosphor 1½

40.) " " 8½ " " 1 " ½

41.) " " 8. " " Magnesia 1 Potassio 3. Potter 1

25) 42.) 50% Reg. Wh. 50% Litharge, ground 2 hs

43.) 67% Reg. Wh. 33% Zinc-oxide
ground 2 hs

29) 44.) 67% Reg. Wh. 33% Carbonate of Lead
Sifted 3 hs.

July 45.)

June 24 07 78°	June 25. 90° partly in cellar	90° in new part.
# 25 0-17	# 35 0-8	# 25 0-18
+W 2.3 11-38 31	+W 2.28 - 22	W 2.48 33
" 29 33	" 29 24.75	" 49 - 35
" 40 34	" 30 26	" 50 - 36
41 34.25	" 31 26.75	" 51 36.5
42 34.5	" 32 27.10	52 37
44 35.25	" 34 27.90	54 37.5
46 35.5	" 36 28.30	56 38 -
50 36 -	40 28.50	3 - 38.75
-W 29.5 (4.5)	-W 22.25 (7.75)	-W 33.25 (4.50)

June 25 91° Reg. black Hard.	Re. White Hard. 91°
0. 15	0 - 17.5
+W 3.8 - 34	+W 3.29 36
" 9 - 42	" 30 37.5
" 10 - 44.25	" 31 41.25
" 11 - 46	" 32 42.25
12 - 46.5	" 33 43 -
13 47	" 34 42.25
15 48.25	" 36 44
20 50	41 45.25
-W 44.25 (5.75)	-W. 39.25 (4)

June 25. 91°	# 27.) 74°	# 27. 73°
# 36 0 - 8	# 37. 0-23.5	# 38 0 - 22.5
+W 2.6 22 (2×3)	W 9 - 0 35.5 (2×3)	+W 9.18 35.4 (2×3)
" 7 28.25	" 1 36.5	" 20 36.25
8 31	" 2 37	" 22 37.5
9 32.25	" 3 37.25	" 23 38
10 33	" 4 37.5	" 24 38.25
12 34	" 6 38	" 26 38.70
14 35	" 8 38.2	" 28 39.5
18 36.5	" 12 39	" 31 39.5
- W 30.75 (5.75)	-W 32.4 (4.5)	-W 33.5 (6)

June 27. 73°	July 2 # 30. 810	29 5 PM
Reg Black 0-25.5	0 - 19	
+W. 9 48 36.5	11-42. 32	
49 - 37.	" 43 36	
50 - 39.75	44 37	
51 - 40.50	46 39	
52 41.	49 41	
54 11.3	54 42.25	
56 42.75	-W. 36.5	
10 - - 42.5	(5.75)	
- W. 36 (6.5)		

July 1st 07.
77°

# 42. 0 - 28.5	#43 0 - 6.5	#49 0 - 12.5
+ W 9.29 18	W 9.41 34	W 10-2 - 28
- 30 51.5	- 45 37	- 5 - 30.5
- 32 52.	- 48 40	- 7 - 31
- 35 52.5	- 51 41.5	10 31.5
41 53	- 56 42.5	- 16 32
- W 46 (7)	- W 36.5 (6)	- W 34 (8)

Dark red to red light

#43 0 - 20
+ W. 10-21 - 31.5
- 22 - 42
24 - 44
28 45.5
33 46
- W 41 (8)

79°

July 2: 86°

# 46 0 - 12	#45 0 23
11 3 - 27	11 - 19 36
4 34.5	20 38
7 40.5	22 39
10 43	25 39.25
15 45.5	31 40
- W 38.5 (7)	- W 32 (5)

87°

July 1. 1907

45.) Stearic Acid 9% Acet. Nickel 2

46.) " " 9% Acet. Nickel 2 Rouge 3
Reg. Bi. Wh. 5 L. Carnauba 1%

47.) " " 9% Acet Nickel 2. White lead 9
L Carnauba 2

48.) " " 9% Acet Nickel 1 Ac. Jon. 1 ~~D. Carnauba 2~~
#15 Doubl 5 White lead 4.

49.) Stearic Acid 9% Acetate copper 1% acet. magnes. 1 Carnauba 3
~~Paraffine~~ Paraffin 1% Ebonit 3

50.) 20 Reg. Wh. 5 hard soap. 2 D. Carnub. 2 Ebonit
#9 Soft & Sticky.

51.) Stearic Ac. 9% Acet Magnes. 1 Acet. Copper 1% Carnauba
L Carnauba. 1 #15 D. 1%
Cracked in mouldings

July 5. 78°

# 47 0 - 18	#48 0 - 21
+ W. 9.10 34	+ W. 9 - 39
18 - 36	- 1 54
14 36.5	2 61
16 36.5	4 67
20 - 36.75	6 69
24 37	9 71
- W 27.2 (4)	- W 64 (7)

July 11.

52. # 51 - 6 d.s. in d. Carnauba 1. Ceresine 1/2

53. # 8^a 12^{ditto} 1 d. Carnauba 1. Paraffine

54. Sl. car. No. II, Sect. Potassa 3) Carnauba 2 1/2
Will Will Paraff. 1 Ceresine 1/2 add 4 Stearic Acid Stearic.

55. Sl. No. 10 Bromide of Potas 3) Carnauba 2
July 28-26 Will not dissolve.

56. Spinnerette # 535

57. " " Reamer-Chips
a Stick to mould
" " mould & core hot
" mould hot ring & core not very hot

56. I II Wk medium hot mould hot core & ring not very hot
III Wk hot mould hot core & ring medium hot chilled
IV Mould not so very hot Wk heavy flows Slowly
mould and all dropped into water
V Wk pretty flows a little more freely. Mould hot chilled quick
VI heated Wk to foaming and let cool down

57. Stamped # 5 cut off thinnest cut. I ran over 5^{min} with heavy weights
reproduces 180 Rev. p. M.

57. 230 Rev. I 1 heavier weight, II 2 light weights III regular no weight
2 min 3 m. 2 m

July 25 86° - 90°.

Wearing tests July 16. 07 79°
180 Rev. p. Min

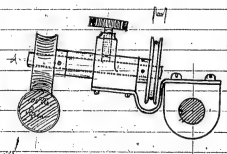
52 1^{min} 2 min.
Reg. 1. 1/2, 2
53. 1/2 1 2

July 25 90°
56^{III} Shaved. 240 Rev 3^{min} reg. Repeated
56^{I} "
56^{VI} Not shaved ran 3^{m} at 230 Rev. reg. Repeat. no scattered
56^{V} " " 3 " " 240 " heavy weight 1/2 2 steel
After pressing in Water 110° T. 225 Stamped.
56^{VI} 3 min 232 Rev. scarcely after cooling in ice water
56^{V} not shaved. ran 3^{m} at 232 Rev. (I before, II after pressing)
57. Shaved after pressing. ran 3^{m} at 232

July 29th # Aug. 12-07
Experimented with Lathing record on new Sheet blocks box from Sylvanette
N. J.

Aug 13th to Aug. 17th 07

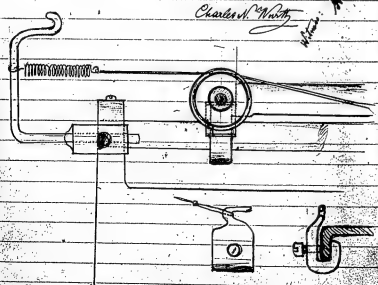
Made 200 thread feed on Reg. Home Bonnet
with 100 tho. screw P.O. 1945



August 17th 1907

Charles N. Wright

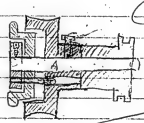
Witness Norman Ostlie



Aug 18th to Sept 17. 07

Experimented with worm wheels and compound
gears for 200 tho. feed.
See sketches on last pages of this book

N. G.



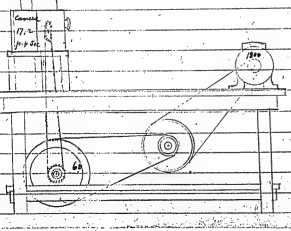
Impossible

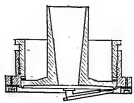
S.O. # 1956.

Sept. 17th 07.

Experimenting with the Kinetophone.

To connect the camera and the recording phonograph by a long shaft, sprockets & chains.
The projecting machine and the reproducing phonograph to be connected likewise by an identical shaft, sprockets & chains.
With this arrangement absolute synchronism will be obtained.
An electric motor to drive the shaft.
To obtain uniform speed a heavy flywheel is mounted on the shaft. A governor is also connected with the shaft.





Diaphragm-holder for flexible diaphragms*) and appliance for stretching the same to the required tension for producing**) an improved sound-record

*) such as banjo-head-skin, parchement, tissues etc.
**) and reproducing

Orange N.J. June 25 th 1906

Charles N. Wurts

Explained to me June 25, 1906
Thomas L. Fine

4
11
13
25
1

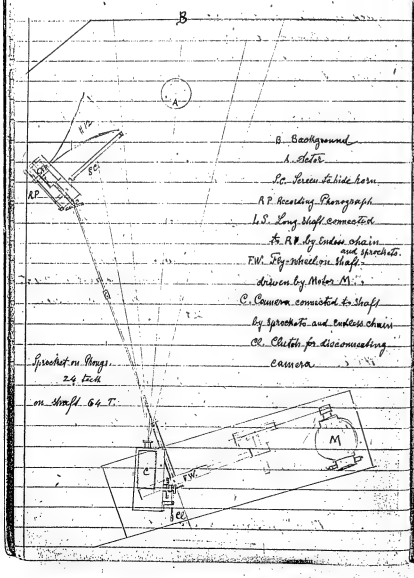
Speed of Motor 1700 to 1800 rev. p. m.
Flywheel 60 rev. p. m.
Camera makes 21 pictures to 1 turn of crank.
Sprocket wheel on flywheelshaft for camera 16 teeth.
" " on crankshaft of camera 20 teeth
On turn of flywheel makes $\frac{21 \times 16}{20} = 16.8$ pict p. sec.

On Projecting-machine, one turn of crank makes 16 pictures. Sprocket wheel on flywheelshaft 21 teeth
" " " crankshaft 20 teeth
On turn of flywheel makes $\frac{21 \times 16}{20} = 16.8$ p. p. sec.

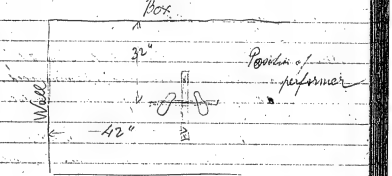
Sprocket wheel on flywheelshaft to drive Phonograph 64 teeth, on Phonogr. mandril 24 t.
Speed of Phonogr $\frac{60 \times 64}{24} = 160$ Rev. p. m.

For a camera which makes 21 pictures in one turn of the crankshaft, the projecting machine has to be geared up differently, viz.
Sprocket wheel on flywheelshaft 21 teeth
" on intermediate 20 "
Gear-wheel on intermediate 86 teeth
instead of 84

17,2 pictures per second



B. Background
A. Actor
S.C. Screen & Speaking horn
R.P. Recording Phonograph
L.S. Long Shaft connected to R.P. by endless chain and sprockets.
F.W. Fly-wheel on Shaft driven by Motor M.
C. Camera connected to Shaft by sprockets and endless chain
C.C. Clutch for disconnecting camera



Manner of Proceding for Taking picture & record

The actor takes his position, the camera is focussed and film inserted, blank cylinder placed on Phonograph and recorder arm let down, stylus 3/4" from edge of cyl. Then the motor is started and lights turned on. The camera is set in motion by clutch, the actor gives a signal with a mallet or other suitable instrument in such a manner that it can easily be seen on the film afterwards and heard on the Phonog. After the signal the actor pauses 2 or 3 seconds before starting the performance. The camera is stopped by throwing out the clutch 2 or 3 seconds after the actor has finished.

To reproducing the film is set in the projecting machine as closely as possible to the signal and the Phonograph also to the starting point of the signal by the ear. The arm being left down and the motor started.

May 1908

First Trial. Picture record # 1. Film # 1.
Pirman nailing packing box in sawing wood.
Speed on flywheel 60 Rev. p. m. Phonog. 160
pts

Film # 2. Same subject.
to be used with P. Rec. # 1. (Pirman Box-nailing)

P. Rec. # 3. — Film # 3. June 13. 08
Pirman Cut picture, singing Twas Corse in Point Carlina
Speed of Flywheel 96., film 27 pict. p. sec. Phonogr. 220

June 16. 08. P. Rec. # 4. Film # 4 (negative)
Same subject. Speed of Flywheel 60 Phonogr. 160 (17)
Film spoiled by not turning on the el. lights.
Only bright daylight at 1.30 P.M.

June 18. P.R. # 5 Experiment. Short film. Speed 60. 160.

P.R. # 6. Pirmans song. I was born in
Length ok

June 23d P.R. # 7. Meckers song. Battering Song
Length ok. Argument between
Trembl. about pitch, caused the two cases
by running of the motor

P.R. # 8.

July 11. 08 Alb. Benzler with Xylophone

Distance of Xyl. p. horn: treble ca 18" bass ca 60
centre of horn ca 6" above Xyl.
horn used for # 5. 6. 7. & 8 = 12½" papier-maché with
tin extension to whole length of 30"

Received pos. print P.R. # 8 July 16th 132 pt

Absolutely perfect display of this film & record
witnessed by Mr. Edison and Mr. Dyer July 19th 08.

Reproduced

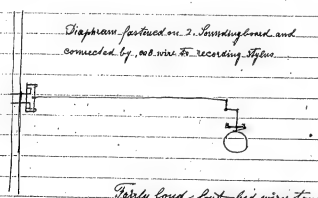
With same arrangement of shaft, projecting machine and reproducing
Phonograph as for taking camera, recording Phonogr. etc.

August 21. 1908.

Experiments with taking Piano-records by means of a stretched wire of .008 diam.

Recording stylus connected directly to 2. Sounding board through a stiff brass-wire.

N.G. Very faint.



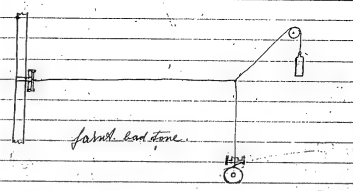
Diaphram fastened on 2. Sounding board and connected by .008 wire to recording stylus

Fairly loud but bad wiry tone

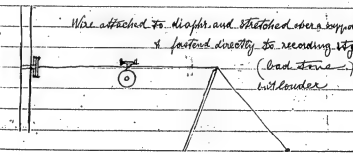
N.G.

Wire supported N.G.

Recording Phonograph with sliding arbor

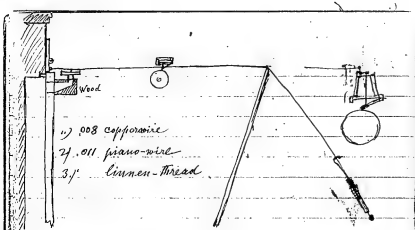


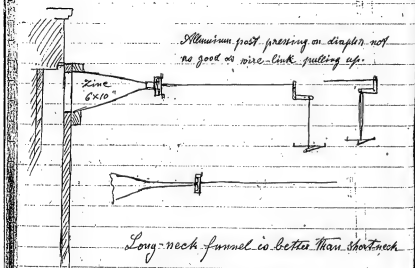
fairly bad tone.



Wire attached to diaphr. and stretched over a support & fastened directly to recording stylus (bad tone.) Will louder

Silk thread instead of wire: very faint.



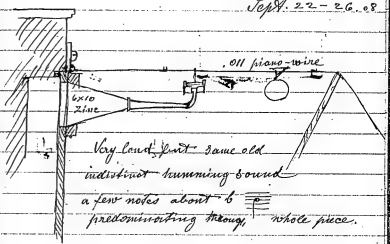


Aluminum post pressing on diaphr. not so good as wire-link pulling up.

Long-neck funnel is better than short-neck

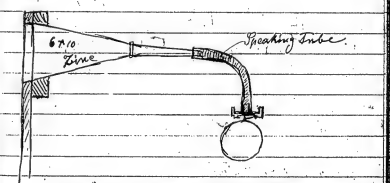
Record louder but indistinct

Sept. 22-26.08

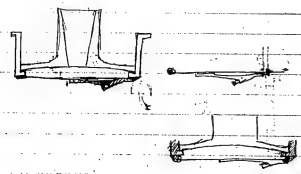


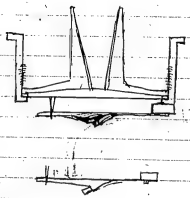
Very loud but same old indistinct humming sound

a few notes about 6 predominating throug whole piece.



Comes out much louder than played but blasts too much





Oct. 7. 08

H. Wolfe
C. Watts

Quite loud
Clear natural tone

Banjo drum with soft rubber cushion
Covered tight to second sounding board

Oct. 8. 08

008 Wire putting up

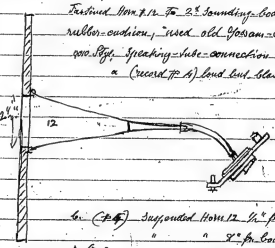
Put aluminum strip and allum. post
pressing down

No improvement

Wire No. 80.

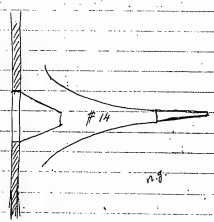
Oct. 12

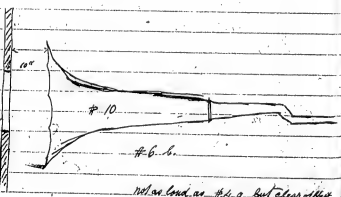
Exp. with 320 Th.
Fastened Horn #12 to 2d Sounding-board with
rubber-cushion, used old Gotham-ch. diaphr.
000 Rgl. speaking-tube-connection to diaphr.
" (record #4) loud but blasting.



b. (#4) suspended Horn 12 ½" from sboard
" " 7" fr. board
O.K.

Oct. 13. 08.





Not so loud as #1, 2 but clear of all #4 a bad tone

November 1908.

Experimenting with 8 min (pin) 200 ltr. records in connection with Permax Air-pressure Speaker

First spring-motor made by J. O. Lund (?) for air-pump 60 rev. p. m. without being connected with speaker.
It takes 1/16 HP (.0587). To work (?) f. o. air-pump 150 rev. p. m. which is just right to produce a fairly loud reproduction with P. Speaker
First f. o. Spring motor has only 1/16 to 1/8 of the power necessary for P. speaker.

Permax air-pump (1 cyl. 1" diam. 1" stroke) requires a 1/32 HP - 110 V. dir. cur. motor, 9 Amp to run the required 200 rev. p. m.
1/16 HP motor with 9 amp. 110 V. = 68 V. - .33 amp.
= 23 watts = 1/32 HP
or:
2 cells of Chl. Accumul. in series with
M. Phonogr. motor, driving pulley 930" driven 1720"
(at centre of sound belt p.120).
= 4.33 Amp. x 3.8 V. = 16.45 Watts = 1/45 (.022) HP

(Accessories by Holland)
Nov. 20. 08. removed governor-belt.

December 22nd 08

Motor of Business-Phonograph on 8" 100th Phon.
same motor on Romans pump; universal resistance
one 16 c.p. lamp between the governor-contact ops.
The pump-motor alone takes, 430 Amp. 113 V = 48.59 W.
both motors together, 700 Amp - 113 V. = 79.1 Watts
Phonogr-motor, 270 Amp. 113 V = 30.51 Watts.

January 5. 1909

John Otto air compressor; 4 cylinders 1.20 Diam
1" stroke, with cork-valves,
Pump-motor alone absorbs, 473 Amp. 117 V = 55 W.
with pump at 180 Rev. 501 = 117 V = 58.7 "

Phonograph-motor alone, 230 Amp. 117 V. 32 W.
with Phonogr. the same
The both together ca. 90 W.

The Phonogr. motor runs faster alone than when
connected with the Phonogr, the difference of the speed
indicates the amount of power required for the Phonogr.

John Otto & Romans pumps must take the same
amount of current in order to give the same
pressure.

January 6. 1909.

The W. Phonograph-motor with one cell of
Chloride accumulator takes 2.6 Amp. 1.93 V = 4 Watts.
To run the 8" 2 3/10" Phonograph at 160 Rev. prob.

January 18. 09

Replaced air-bottle by a cylinder (concentrated)
covered on one side with three thicknesses of
.023 sheet rubber; no difference.

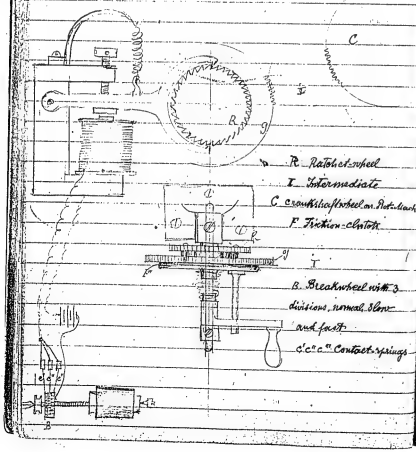
February to April 10. 09

Experimented with different forms
motors, air-pressure, tubes etc.
for Romans speaker

April 12. 1907

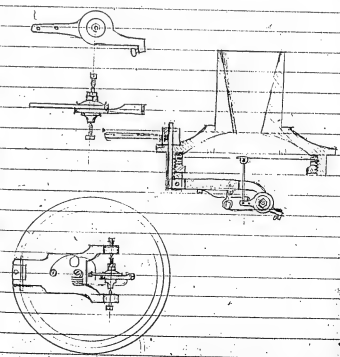
Experiment work for Mr. Dyer #2066

Synchronizing arrangement for Phonograph and Motion-machine



May 13. 07 Received one positive print of P.R. # 7 (Mecho) for S.O. proc.

June 14. 07 Make Reproducer with compound Rep.-Bell-lever held together by friction



July 16. 09.

Make Reproducer with Rep. ball lever swinging around centre of Diaphragm instead of hinge on edge.

Weights of Diaphragms in milligrammes, reg. Diam.

Mica 4 thick's of	.002 each	278
Cork	.080	308
White Celluloid	.0065	201
Reg. Copper	.0025	598
Hard rubber	.0065	185
Aluminum	.005	299

November 23rd to Dec. 17. 1909

Make pressed duplicates of wax & celluloid for leg dept.

Dec 1. Blanc of hard 4 min master-wax
Length of mould 4.125.
Diam. 2. 181 – 2.197 Taper No
Length of blanc 4.260
Diam. 2.180. – 2.196
Temp. in core 113°; in tank 124°. 25 min.
Small end not pressed out full, large end nearly full.

Dec 2. Mould Expanded to 2.190 – 2.198
blanc 4.253, 2.192 – 199
Temp. in tank 135
" core 125 to 130
time of exposure 35 min.
Time for cooling in open air at 5°C. ½ hour.
blanc was slightly too large

3. 4.252, 2.191 – 2.198. 124° in core 130 in tank
Exposed 30 min. O.K.

Dec. 20th 1909 to Jan 1910

Made scales for weighing Speaker-Weights.

Adjusted Jewellers Scale and made a set of extra weights: 2-1/8 oz 2-1/4, 2-1/2, 1-1 oz 2-2 oz.

Made one auxiliary scale for ~~making~~ marking Division on dials.

January 1910 to February 8.

Made two scales for weighing reproducer-weights, One for regular inclined arm, one for level arm. Mounted on V Sleeve to go on ~~Prem~~ arbor, a spiral spring to lift up a lever which lifts the weight. The pin which bears and works the spiral spring also bears the index-hand, which shows the weight on a dial.

1910.

February to March 22. With interruptions for other Experim.
Made four scales for weighing Reproducer Weights
as suggested by Mr. Edison — Dec. 20. 09

March 23. 1910.
Finished arrangement for gauging different kinds of blowers.

1910

March 25 to April 2

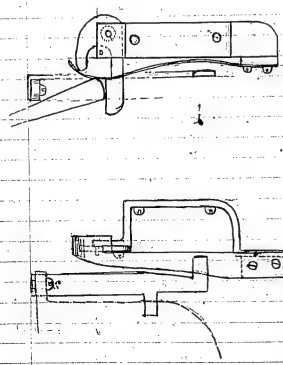
Made improvements on apparatus for removing wax chips from master-records under the microscope; for Mould Department.

April 2 to 30.

Worked on blower-tests, record-cleaners etc. etc. etc.

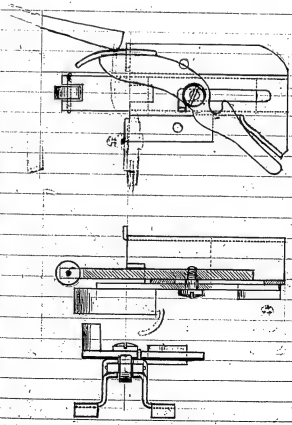
May 2. to 7th 1910.

Automatic Switch for Business Phonograph.
(Made 9-14.)
My scheme: finished May 16.



May 17. to June 2d

Improved M. Schaffels model of automatic switch for Business Phonograph and made a working model.

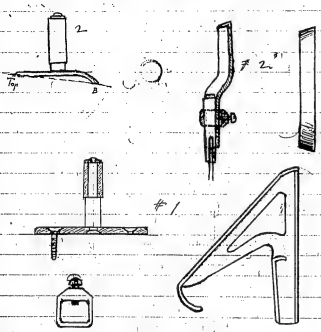


June 6th 1910.

Automatic Stop for Business Phonograph

#1 pat. #2 off-set

To be clamped onto Switch-door.



June 7th to July 7th 1910
Laid up with Gout.

July 17. 1910

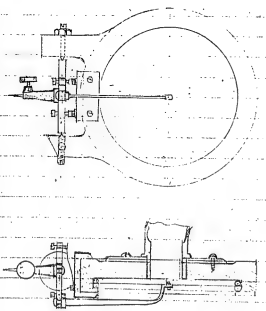
Started on improvements experiments on Moving-picture-machines
By order of Mr. Shaffer.

July 13. to laid up with gout.

July 20. Put off experiment till apparatus are finished

July 20. 1910.

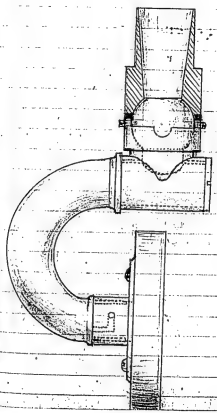
Make Disc-reproducer f. Side-ways-cut-record.
By order of A. Sh.



1910.

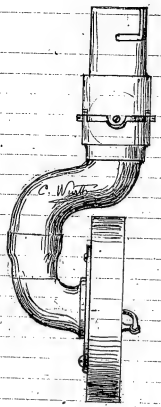
August – September –

Made corrections for using Victor-discs on new Edison Disc-Machine

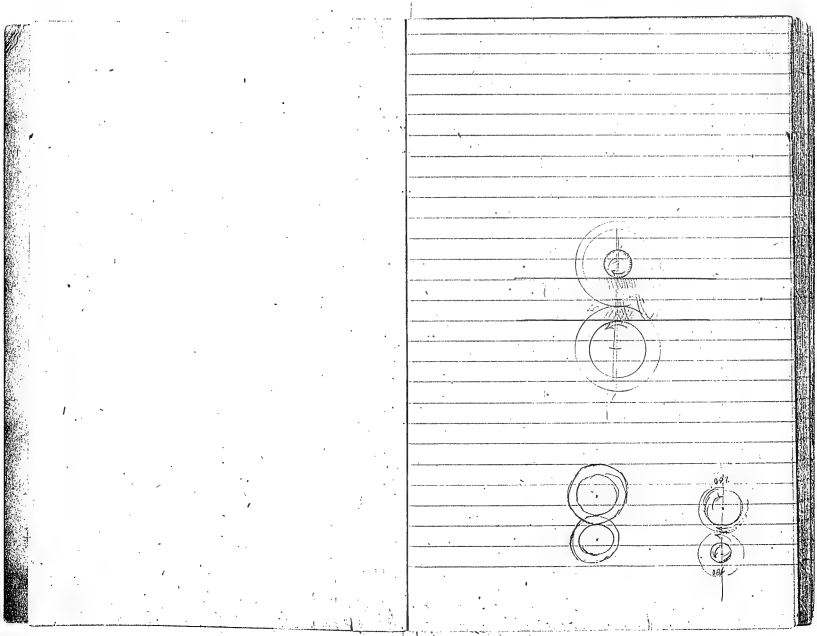


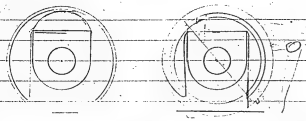
1910

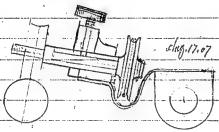
Sept. 13.



[THIS BOOK WAS USED IN BOTH DIRECTIONS. THE FOLLOWING PAGES WERE FILMED FROM THE BACK END FORWARD.]



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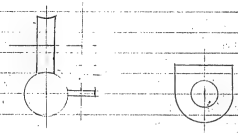
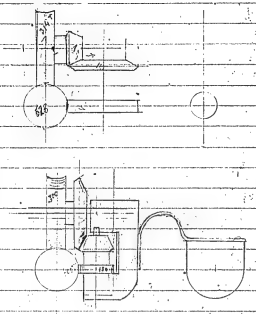


1945 Aug 24 07 C.W.

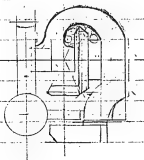


956
19

300/214 95.54
2814
1540
1540
1300
1300

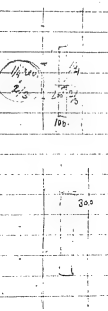
Aug. 27th 07

C.W.



504

152



[ITEM FOUND IN BOOK]

H. Wurth

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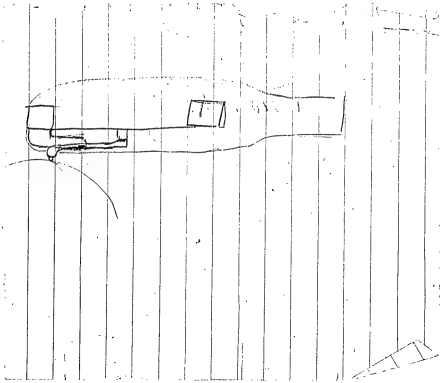

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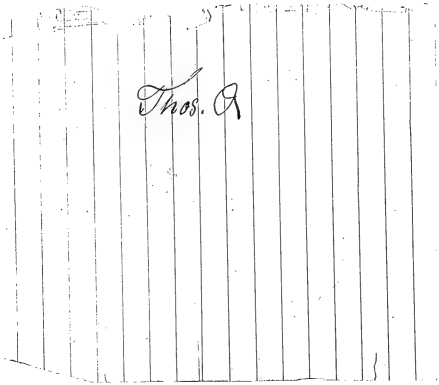

[ITEM FOUND IN BOOK]

M. Victor Ethienne Prétot, mechanics, living in Paris, 10 Rue des Immeubles industriels, has appeared before M. Adrien Cachard, ~~[illegible]~~ and his colleague, the undersigned notaries in Paris.

(He) (Prétot) has by these presents designated as his attorney M. Charles Wurth, mechanic, living in Camden, near Philadelphia, 10 York Street (United States of North America).

To whom (Wurth) he gives the power for him and in his name to:

Develope in the United States of America and particularly in Philadelphia, according to the conditions which the attorney will take notice; the patent which was awarded to him in France on the twenty fifth day of February, one thousand six hundred and eighty nine under the number 140655 for the invention of a machine to clean knives, as well as other patents which the principall might obtain.

To take out all patents of improvement or certificates of addition, to change them or withdraw them if that should take place.

In consequence to present to any competent authority, all demands, petitions and requests, to present to all officers and officers credentials and commissions which may be necessary, to sign and approve all descriptive articles, to require all verbal warrants, to contract all engagements, to change or withdraw all taxes.

[ITEM FOUND IN BOOK]

To sell and to cede to persons according to the price, the charges, conditions which the attorney will judge convenient, the above-said patents, patents of improvement, certificates of addition; to they ~~[illegible]~~ permanent or for a determined period of time — to receive the prices for the said sales and cessions as well as all other sums which might arise from the exploitation of the said patents.

In case of the failure of any debtor, to take part in all deliberative meetings of creditors, to name all representatives, to make temporary or permanent, to open all agreements, contracts, or [illegible], and if any one refuses to produce all titles and deeds, to affirm the sincerity of the credit of the principal, to contest or adjust that of the creditors, to make all remittals and to receive all dividends.

In case of whatever difficulties there may arise and in default of payments

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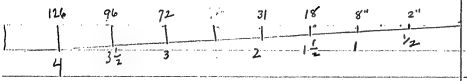
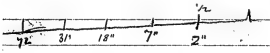


(4 ft up-mirror) ½ mile periscope up 4 ft, just see top-
periscope can see ship silhouette, 28 ft-

4 ft mirror, see periscopi, ~~[illegible]~~ 4 ft up see 8" of
hull
periscope sees 20.4 of ship

4 ft mirror 1½ mile - see 1½ ft of periscopi - Sub 6
secs.



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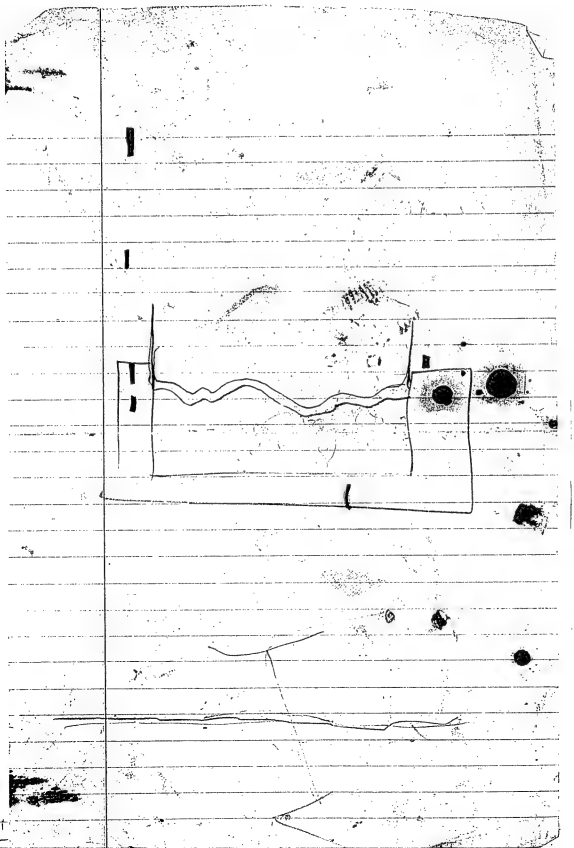

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CYLINDER RECORD MFG. BUSINESS

OFFICE OF DIVISION MANAGER

March 22, 1920.

Mr. A. Wurth, Supt.
Cylinder Record Mfg. Division

Effective Monday, March 22nd, and until further notice the following temporary rate will apply to the Reaming Operation:

This rate will be subject to withdrawal or revision at any time when, in the opinion of the management, it has not accomplished the desired results.

Starting Rate: Operators will be engaged at 45¢ per hour and rated at that figure until such time as they qualify for piece work. This period should not be over one week.

Qualifying for Piece Work: When one operator has reached an output of 80 boxes in 8 hours and a not o.k. production of not less than 96%.

Base Rate: $.13 per 100 records reamed.

Cooperative or Differential Rate: When the not o. k. production for the entire reaming force reaches 97% the rate is automatically adjusted to $.135 per 100 units; 98% $.145 per 100 units and 99% $.155 per 100 units. The individual earning will, of course, be based upon the individual production.

Advantages: The earnings of the entire force will not be affected by one or two slow operators or absentees - quality only will increase or decrease the rate.

One or two operators producing 70 or 80 percent o.k. work will reduce the earnings per 100 units of the entire crew.

Foreman participating on the same percentage basis, figured over a period of a week, will exercise closer supervision and eliminate poor operators.

Limitations and Penalties: The production per operator should be limited to 110 boxes per day. This to be accomplished by number of operators rather than by limiting the number of boxes delivered to each operator.

[ITEM FOUND IN BOOK]

Mr. A. Wurth, -2

Method of Computing: In arriving at the percentage figure the over and under-gauge and eccentric records at gauging will be used as the base. Operators will not be penalized by discards over which they have no control.

Earnings: The attached example will serve to show how this will effect an operator's earnings.

The foreman's earnings increasing at the same percentage ratio based on the average for the week will be as follows: Base $29.00. 97% week $30.15. 98%, $32.50 - 99%, $35.00.

To encourage the highest possible quality this rate should be explained to each operator and it would no doubt be advisable to post in the reaming room the prevailing rate for the week and day previous.

W. E. Samborn
WES.
Division Manager.

Alexander N. Pierman Notebook
[unnumbered]

JANUARY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

SUNDAY	A J Pierman
1 MONDAY	The following are experiments with Vacuum Reproducer
2 TUESDAY	tried rubber valve on Vacuum reproducer tone good, very weak
3 WEDNESDAY	tried doubble thickness Celluloid for Valve on Vacuum reproducer works better than single
4 THURSDAY	
5 FRIDAY	tried holes in Valve instead of slots
6 SATURDAY	

JANUARY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

7 SUNDAY	transmitter
8 MONDAY	tried fading Valve with paper to stop squeal. N. G.
9 TUESDAY	received carbon Dia from Wong
10 F **10** WEDNESDAY	
11 THURSDAY	tried flat spring seems better
12 FRIDAY	Gave details of Valve to Mr Lewis the draftsman
13 SATURDAY	

JANUARY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

14 SUNDAY	
15 MONDAY	
16 TUESDAY	Made milling fixture for cutting lines grooves in valve
17 WEDNESDAY	made Reducing Valve for air pipe
18 THURSDAY	
19 FRIDAY	
20 SATURDAY	

JANUARY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

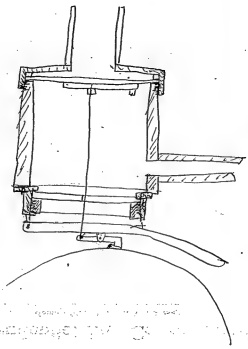
21 SUNDAY	
22 MONDAY	made separate seed Valve. also tried fastening valve on both ends
23 TUESDAY	found cause of squeal. cut side slots and stopped it
24 WEDNESDAY	
25 THURSDAY	made Valve-seat with slots forming a square
26 FRIDAY	
27 SATURDAY	

FEBRUARY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

11 SUNDAY	
12 MONDAY	
13 TUESDAY	
14 WEDNESDAY	Changed to large chamber blow valve in Vacuum reproducer, same principle as first model made. OHP
15 THURSDAY	
16 FRIDAY	
17 SATURDAY	



FEBRUARY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

18 SUNDAY	
19 MONDAY	Mr Lewis made drawing of the large cavity model Vacuum reproducer for Patent Office as above ↑ AGP
20 TUESDAY	
21 WEDNESDAY	Mr Edison Mr Gilmore Mr Weber Mr Bergman Mr ? called to hear Vacuum Reproducer all pronounced it a success. AGP
22 THURSDAY	
23 FRIDAY	
24 SATURDAY	Received drawing of air tank from Lewis, made sketches of 3 cyl" pump and turned them over to Lewis.

FEBRUARY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

25 SUNDAY	
26 MONDAY	Went to N. J. Recd Dept to examine reduction value
27 TUESDAY	
28 WEDNESDAY	
1 THURSDAY	**MARCH, 1906**
2 FRIDAY	
3 SATURDAY	

MARCH, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

4 SUNDAY	
5 MONDAY	Finished reducing Valve for use with Vacuum reproducer.
6 TUESDAY	
7 WEDNESDAY	
8 THURSDAY	
9 FRIDAY	
10 SATURDAY	

APRIL, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

8 SUNDAY	
9 MONDAY	
10 TUESDAY	
11 WEDNESDAY	
12 THURSDAY	
13 FRIDAY	Finished small vacuum pump crank motor
14 SATURDAY	

APRIL, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

22 SUNDAY	
23 MONDAY	
24 TUESDAY	
25 WEDNESDAY	Finished upright vacuum pump walking beam motor
26 THURSDAY	
27 FRIDAY	
28 SATURDAY	

APRIL, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

29 SUNDAY	
30 MONDAY	
1 TUESDAY	MAY, 1906
2 WEDNESDAY	
3 THURSDAY	
4 FRIDAY	Finished upright Pump. Not to be held in position by leg of chair.
5 SATURDAY	

MAY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

6 SUNDAY	Coney Island with W. G. T.
7 MONDAY	
8 TUESDAY	Tried Centrifugal pump experiment.
9 WEDNESDAY	
10 THURSDAY	
11 FRIDAY	
12 SATURDAY	

MAY, 1906

The Prudential Ins. Co. of America

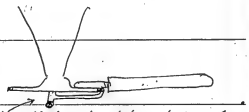
Home Office, Newark, New Jersey

20 SUNDAY	
21 MONDAY	
22 TUESDAY	
23 WEDNESDAY	
24 THURSDAY	
25 FRIDAY	Made rubber pad bearing tube for numerical machine
26 SATURDAY	

JUNE, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

3 SUNDAY	
4 MONDAY	
5 TUESDAY	Finished model of surface testing reproducer for use on shaving machine, should come to the layer and left model to have drawing made for Patent. [illegible]
6 WEDNESDAY	
7 THURSDAY	
8 FRIDAY	
9 SATURDAY	

JUNE, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

10 SUNDAY	Rockaway Beach
11 MONDAY	
12 TUESDAY	
13 WEDNESDAY	
14 THURSDAY	
15 FRIDAY	Finished foot pump (4 cyl)
16 SATURDAY	

JUNE, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

24 SUNDAY	
25 MONDAY	
26 TUESDAY	
27 WEDNESDAY	Finished float. Bellows works O.K. CJP
28 THURSDAY	
29 FRIDAY	
30 SATURDAY	

JULY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

8 SUNDAY	
9 MONDAY	
10 TUESDAY	
11 WEDNESDAY	
12 THURSDAY	
13 FRIDAY	Received castings for memorandum tape attachment for Business Phonograph
14 SATURDAY	

JULY, 1906

The Prudential Ins. Co. of America

Home Office, Newark, New Jersey

22 SUNDAY	
23 MONDAY	Made Remington table, found out interesting fact concerning [illegible] of [illegible] of Dickinson & the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
24 TUESDAY	
25 WEDNESDAY	
26 THURSDAY	
27 FRIDAY	
28 SATURDAY	

Notebooks by Experimenters Other Than Edison
Group 8: Miscellaneous Experiments

The thirty-four notebooks in this group primarily cover the period July 1900-July 1911, but several contain entries from as late as 1914. They were used by Edison employees, including Arthur H. Glaister, Walter E. Holland, and Ludwig F. Ott, and contain only occasional notations or drawings by Edison. The entries pertain to a variety of subjects. Included is a book by Cloyd M. Chapman providing details of his work on a dry placer process for gold ore concentration and several books by other authors on radioactivity. Also included are notes on tests of primary batteries; experimental notes pertaining to lamps, mining, metals, the "Edison effect," electroplating, oil filtering, and ore separation; and a few entries regarding photography and motion pictures. In addition to the entries by Chapman, Glaister, Holland, and Ott, there are notes by Alvin D. Caskey, George Hetherington, John F. Ott, and others. Two of the books, N-Undated.38 and N-06-11-21, contain rough drawings by Edison that appear to be unrelated to the contents of the books themselves; N-03-12-18 contains a loose note from Edison to Robert Rafn.

Entries from ten notebooks have been selected. Partially selected books are indicated by bracketed comments and bracketed numbers noting the approximate percent of pages selected.

N-Number	Inscription on Front Cover or Flyleaf
	[additional information supplied by the editors appears in brackets]
Selected Books	
Undated.38	"Edison Lab Orange NJ Notes HBM." [notes on plating cylinders, ca. 1899-1900; only the (unsigned) Edison drawings have been selected]
00-07-13	"Experiment upon Lamp for Cheap Hand Keneto—Laboratory Charge No. 1049 Louis Ott" [contains only 4 pages of notes]
03-00-00.1	"Placer Process General Notes" [technical notes and rough accounts by Cloyd M. Chapman]
03-12-18	"Rob. Rafn Dec 18 1903" [notes entitled "Substances tried for Radioactivity"; only a loose note from Edison to Rafn has been selected]

05-02-18 "Miscellaneous Readings & Tests Vol. I 2-18-05 – 8-18-06"
[by Walter E. Holland; only his incandescent lamp notes have been selected] [10%]

06-11-21 ---
[ore separation experiments; only the (unsigned) Edison drawings have been selected]

05-00-00.5 "Experiments upon Uranium Salts & Radio Activity"
[by Arthur Glaister; only his "Experiments in Stereoscopic Photography & lantern projection" have been selected] [10%]

07-06-17 "Metallic Films 6/17/07"
[by Walter E. Holland]

07-06-18 "Experiments on the Scintil[l]ations of the different metals under the electric spark"
[by Arthur Glaister]

07-08-12 "'Edison Effect.' 8/12/07"
[by Walter E. Holland]

Books Not Selected

01-00-00.1 ---
[notes entitled "Calculations on the maximum stresses in an automobile."]

01-00-00.2 ---
[continued calculations on stresses of automobile parts]

01-02-19 "Separator"; "2/19/1901 to"
[notes on ore separation]

01-06-06 "Primary Battery Tests"
[multiple authors]

02-02-17 "X Ray No. 1 Chemicals 2/17/02"
[by George Hetherington]

02-04-02 "X-Ray Chemicals No. 2"
[by George Hetherington]

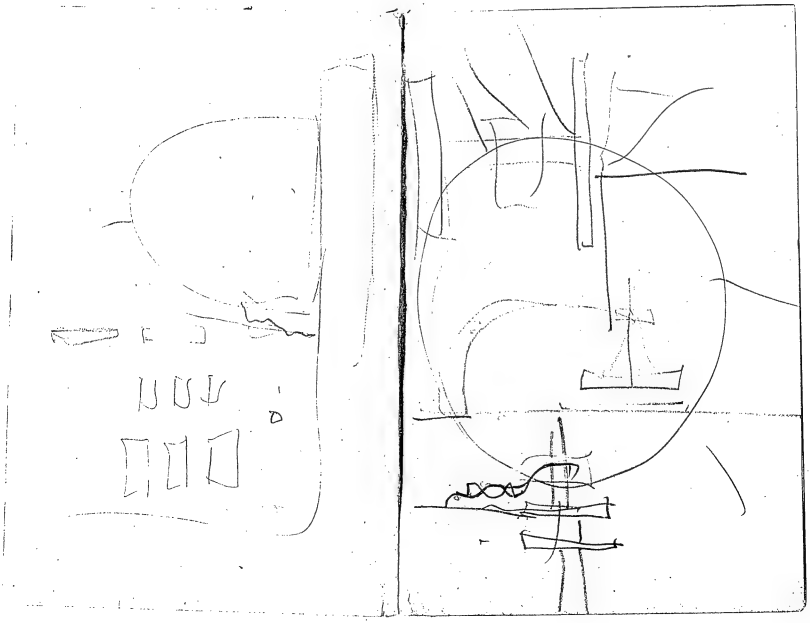
02-05-19 "X-Ray Chemicals No. 3"
[by George Hetherington]

02-08-09.1 "Hetherington's Chemicals. Book No. 1. From 30001 to 32484"
[by John F. Ott]

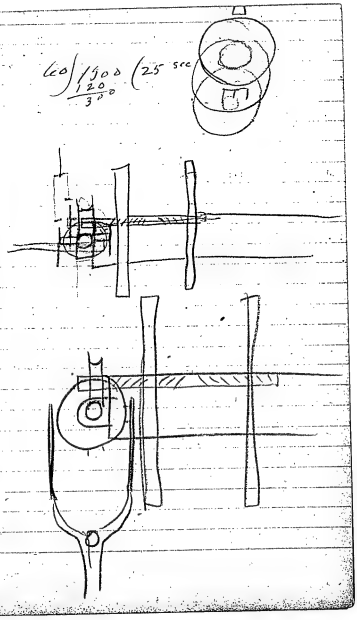
02-08-09.2 "Hetherington's Chemicals. Book No. 2. From 32485 to 34900"
[by John F. Ott]

02-08-09.3	"Hetherington's Chemicals. Book No. 3. From 34901 to 37315" [by John F. Ott]
02-08-09.4	"Hetherington's Chemicals. Book No. 4. From 37316 to 37963" [by John F. Ott]
03-05-20	--- [notes on ore processing]
03-12-11	"Experiments upon Radium by T. A. Edison" "Witness Ludwig F. Ott Dec. 11, 1903" [by Ott, several pages only, in expectation of experiments by Edison]
05-01-24	"Caskey. Alloy's Metallic Drums. And Pencils Jan 24–05"
05-10-04	[notes on ore samples tested for radioactivity, apparently by Alvin Caskey]
06-11-30	"Record of Switch Board Rdgs Started Dec. 1st"
	[switch board readings probably having to do with storage battery tests]
07-00-00	---
	[notes entitled "Experiments upon Phosphorescent Salts. No. 1973."]
07-02-06	"Cold Test on Edison Primary Cells. Latchford, Ontario. 2/6/07" [by Walter E. Holland]
07-06-20	"Walter E. Holland June 20, 1907" [graphs of data from N-07-06-17 and N-07-08-12]
07-09-27	--- [notes entitled "Measurements about Radioactivity Sept. 27. 1907" and illustrating apparatus]
09-01-15	"Experiments on Electric Arc Drilling of stone by means of electric arc. Jan. 15, 1909 Robert Van Benthuysen"; "Experiments also on the C-Fe_2O_4 arc for rectification"
10-06-22	"Notebook of Ludwig F. Ott Containing Experiments and Analysis made in the Laboratory of T. A. Edison From June 22 1910 to July 21, 1911"
Undated.28	--- [one page of notes comparing German silver and copper wire]
Undated.33	--- [notes entitled "Oil Filtering" and notes on brushes for motors or generators]

Notebook, N-Undated.38



60) 1900 (25 sec
120
300



Notebook, N-00-07-13

N-00-07-13

XE-172

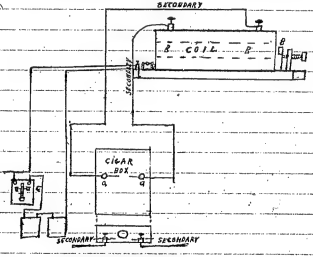
Experiment upon

Lamp for Cheap Hand Stencils

Laboratory Charge No 1049

Louis Ott

Experiment Started this 7th day of July 1900 A.D. Started on ending of experiment Crude working model this 13th Day of July 1900 A.D. Finished 1900 A.D.



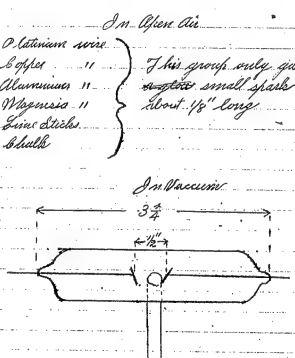
A cigar box with a 1" hole at one end and two binding posts a a was made to connect within with a glass tube or other substance through which current may be passed, box was made dark. The current was led from 2 Type E Chloride Accumulators to the Coil the vibrator of which was short circuited to Morse Telegraph Key C thence back to Battery two secondaries led to binding posts a a

In Open Air

Platinum wire
Copper "
Aluminum "
Magnesia "
Lime Sticks
Chalk

} This group only gave ~~a very~~ small spark about 1/8" long

In Vacuum



(In using salts no discs were used)

Copper	and Calcium Cyanide	(No Good)
"	" Nickel "	(Fair)
"	" Bismuth "	(No Good)
"	" Molybdenum "	(No Good)
"	" Lead "	(Fair)
"	" Silver "	(No Good)
Silver	" Strontium "	(No Good)
Calcium	Cyanide Copper Sulphide	(No Good)

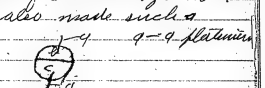
Uranium and Cadmium Benzoates (Good)

Used in the same kind of a glass tube were inserted 1/2 inch apart discs

□ 3/8 square PLATINUM | PLATINUM

with platinum leads.
1 copper disc
2 Aluminum discs Stuck up the best
3 Platinum discs Smoke Glass

Made Platinic Cyanide of Barium which was fair
Tungstate of Calcium gave best Results also made such a lamp



poles C tin foil C = Calcium Tungstate pattened to the glass by means of heat Quinine Sulphate Not Good
Barium Sulphide loses properties on exposure to light

Made Coffer Cyanide which was not very good.

Zirconium Oxide

Notebook, N-03-00-00.1

1000 tons per day of 20 hrs
50 " " hr
machine will do 2 tons per hr
2.5 machines required
Screens will do 1 ton per hr
50 banks of screens needed
30 screens high + 4 coarse

1500	screens	1st	size
1200	"	2nd	"
900	"	3rd	"
600	"	4th	"
300	"	5th	"
200	Crusher	1st	"
160	" "	2nd	"
120	" "	3rd	"
80	" "	4th	"
40	" "	5th	"
5200	screens in 5 groups		

1st	Bank	50	screens	wide	34	high
2nd	"	40	"	"	34	"
3rd	"	30	"	"	34	"
4th	"	20	"	"	34	"
5th	"	10	"	"	34	"

$20 per screen for construction

~~$2,000 for stacks & screens~~

$20 per 1000 for timber work + cost of lumber.

Steam Shovel $12,000

Grizley or Shovel 6,000

Trestle + Grizleys $5,000

2 trains of 8 cars. cars 60 to 700 each

2 locomotives $6,000 each

$10,000 per mile. 60 lb rail Broad gauge

~~$10,000~~ $6,000 for Dryer

Wet Storage bin $1,000

Belt conveyors $20 per for 17 or 18 ft.

1 steam shovel handling 3,000 tons or 2000 cu yds in 10 hrs. Shovel to work only 1 shift. 10 hrs Mill to run night and day.

R. R. Cars (Dumping, and Rails & Engines, trestles &c. Screens at shovel.

Dryer, if needed, to work either 10 or 24 hrs. according as material from shovel is stored before or after drying.

Blowers $150 each 33% more power than needed

$300 for Magnetic sep.

At Edison Portland Cement Co. works Conveyor from Rock Crusher to Drier is about 275 ft long 24" belt running 500 ft per min took about 4½ HP running light

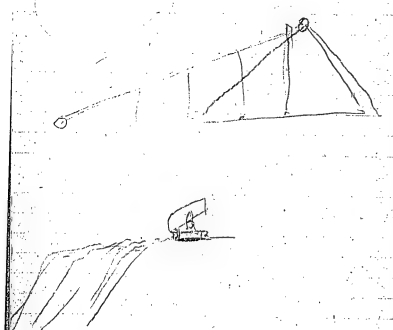
275 ft
4½ HP

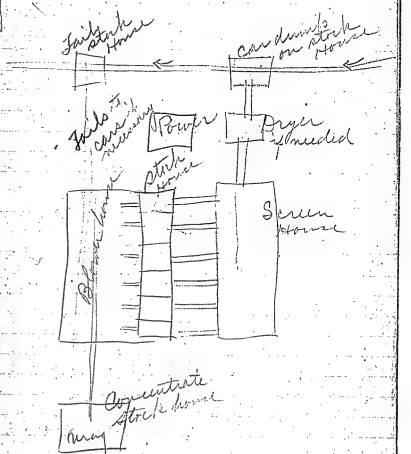
24"
Conveyor
500 ft per min

Screens as per first page delivering into separate ~~stock~~ storage compartment for each size — say 6 sizes

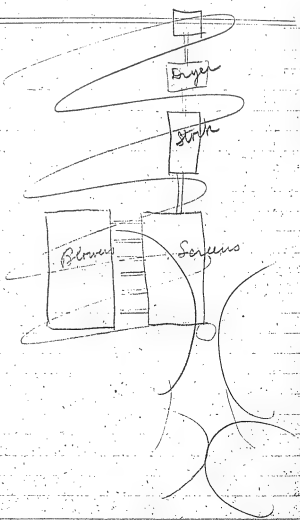
25 Blowers for each 1000 tons, say 2 blowers on largest sizes; 3 for intermediate sizes and 4 perhaps 5 for fines.

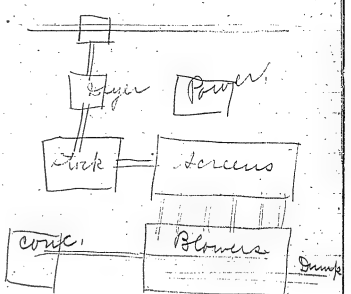
Concentrates to be treated magnetically if it contains much iron or concentrated,



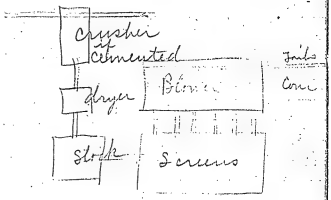

Power
Dryer
Screen
Concentrate

£100 per horse power for
[illegible]
[illegible] per K.W.hr.
4½d per H.P.hr. for running
[illegible] per 100 ft. [illegible]
flue system




Engine
Power
Stack
Screens
Coke
Blowers
Dump

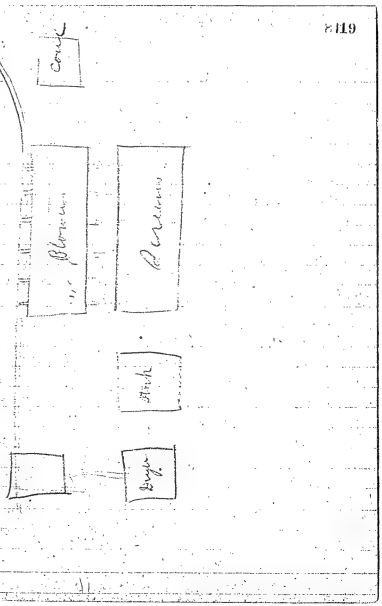
Shovel
Rotary Screen (run by power from shovel)
Cars
Track
Trestle
Dumping house
Conveyor to dryer
Drier
Conveyor to Stock house
Stock House to hold 1/2 daily capacity
Conveyor to Screen house
Screen House
5 200 screens for each 1000 tons
5 elevators between screen banks
6 Conveyors from screens to bins
6 Conveyors from bins to Blowers
25 Blowers for each 1000 tons
Blower house
Conc. Conveyor under Blowers
Tailings Conveyor " "
Conc. Stock house
Tailings dumps.
Power house


Crusher
Cement
Dryer
Blower
Tailings
Conc
Stock
Screens

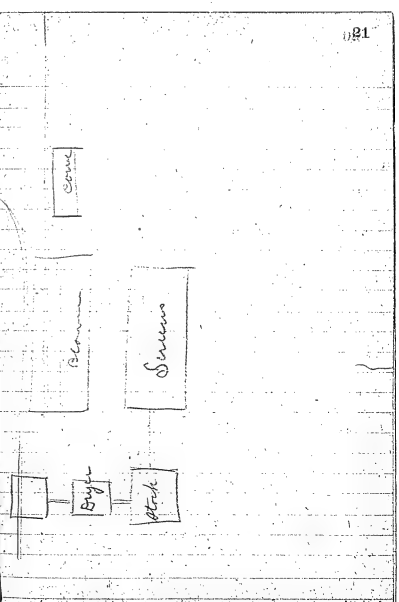
Screen
Screen
Screen

Labor & Expenses

Shovel Gang	Shovelman	3.00
	Engineer	2.50
	Fireman	2.00
	4 Pit men	6.00
Oil		2.00
Coal 4 tons		16.00
Train Gang	2 Tong	5.00
	2 Brakemen	4.00
	2 Firemen	5.00
	Coal & Oil	10.00
	2 Dumpers	3.00
Dryer	2 firemen	4.00
	2 Helpers	4.00
Conveyor & Screens 2 men		4.00
Screens 6 men		12.00
Blowers 8 men		16.00
Power	2 engineers	7.00
	2 Firemen	4.00
	Electrician & Asst.	7.50
Conc. May, Sep 4 men		8.00
		123.50



Brought For'd	123.50
Oil men 2	4.00
5 Laborers + Foremen	10.00
Foreman Mach. shop	4.00
5 Machinists	15.00
3 Helpers	4.50
2 Carpenters	7.00
Master Mechanic	5.00
Man + Team	3.00
Manager	6.00
Mill Supt.	5.50
Brook Keeper	3.00
Clerk	2.50
Boy	.75
10 Extra men	20.00
	213.75
Sinking fund	90.00
	313.75
Coal — 8 tons	40.00
Oil	3.00



Power

Sarlo
B Comunis
Pruni

Engine
Blower
Blowing
Cupola
Spark
Spark

1st Storage bin - under car dump.
to hold 750 tons, 500 cu yds or 13500 cu ft ... 25 ft cubes
giving say 20,000 ft at 45¢ per ft
$900 Say $1000

East Storage bin - over cars
similar size as first say $1000.

Conveyor [illegible] high 50 ft
[illegible] 70
[illegible] 30
[illegible] 25
180 ft

Co[illegible] – [illegible] 1/2 HP

[illegible] = 2 1/2 HP

[illegible] 2000 [illegible] = 360,000 [illegible] = 11 HP

Co[illegible] 40 HP

33 blowers at 1 1/2 HP each
or 50 HP

50 Rollers at 1/4 HP each
or 12 1/2 HP

Dryer

Conveyor to Dryer

Dryer 50 ft high 17 1/2%
elevation of Conveyor –
conveyor 270 ft long at $16
per foot = 4,650 Say $5000

30 000 12500
10 000
5000
10 000
30 000 13500

2800
2 8000
1 5000
2 8000
1 5000
8 8800

89
45
445
356
4005

Dryer

Say $6,000

Conveyor to Screens
Screen house 75 ft high
Conveyor 17½° pitch 430 ft long
No Figures for $7,000

Screen house 90 ft high
50' X 50' say $1,500

Screens 64 high 10 banks
$50 per bank $2,500

Shutes & conveyors to Blowers
Say 30 ft high or 170 ft long
Sh conveyor. or 1020 ft x 16 wide
Say $16,000

33 blowers at $150 = $5,000

Blower house 35 ft high 40 X 350
Say $4,000

Tailings company
3500 + 145 = 45 days
$8,000

Cone company 350 + 100 = 450 ft
$7,200

Cone done $2,500

Conveyors. To dryer - 50 ft high
" to screens - 75 ft high
" to Blower 180 " "
305 "

17½% or 1800 ft
Tails Conv 500
Conv Conv 450
2750 ft Conveyors @ $/6
= 44.000

28
3½
31

70
20
99

33
3
44

50
310
15500
2000
31000000
33 | 516
20

250 HP
40
1000

Figures of Mr. Simpkin

Cost of 2,000 yd plant

Steam shovel 60 ton Vulcan	8000
Grizzly conveying	6000
Locomotives (2)	8000
Rails & track	5000
Storage bin 500 tons & cover 21 m @ 33	750
Drier	5000
Drier House 30x30x10 12 m ~~[illegible]~~	420
Screen house 30x50x90 43 m.	1500
Screens	4000
Separator house 20x33x15 45 m.	1400
Separators 32 @ 150	5000
Conveyors	44000
Tailings bin	650
Power Station 200 HP @ 50	10000
Motor drive 200 HP @ 20	4000

Labor Account

Shovel—

1 Engineer	5.00
1 Fireman	3.60
1 Craneman	2.60
6 Laborers in pit @ 1.50	9.00

Trains.

2 Engineers	10.00
2 Firemen	7.20
2 Trainmen	5.20

For Experimental plant at Lab.

10 screens each of 5 sizes
.007, .015, .029, .058, .094.

Screen frame or bank, 10 screens

Separator complete 4 ft wide
of Sheet Iron

Cost of Steam Shovels.

Vulcan Little Giant Traction		1¼ yd.	$5,500
" Little Giant Traction Special		"	6,000
" " " Trucks		"	6,000
" " " "		"	6,200
Bucyrus 35 ton		1½ yd	5,000
45 "		1¾ or 2	6,500
55 "		2 or 2½	7,250
65 "		2½ or 3	8,500
70 "			9,000
75 "		3 or 3½	10,000
85 "		3½ or 4	11,000
95 "		5 yd.	12,000
M. Mitchell Co.		2 yd	4,500
Apex. Little Giant Traction (ap.)		1¼ yd	3,300
" " Trucks		" "	3,800
Marion Model J		2½ "	6,800
" " A 45 ton		1½ " 3 to 4½	7,500
" Improved A		3 to 4½	5,500
Thew 30 Lorain truck		1 yd	3,750
No 1 " "		1 yd	5,200
No 3 " "		1½ "	7,000
No 7 Excavator		1¾ "	6,250
No 6 "		2½ "	8,500
No 5 "		3 or 3½ yd	10,000

Steam Shovels Cont'd.

Dump Cars.

Apex.	3 yd	36"	SSD.	Wood 2nd hand	$45
	3 "	36"	SSD	" new	111
	3 "	"	DSD	" "	121
	4 "	"	SSD	" "	123
	4 "	"	DSD	" "	135
Add $10 to last 4 above for standard guage					
	5 yd	4'-8½"	SSD	Wood	145
	5 "	"	DSD	" "	165
	6 "	"	SSD	"	160
	6 "	"	DSD	"	175
Every 5th car with 1 brake free Brakes $9					
"Recking"	24" - 3 yd.		Oak	DSD	20.
	36" - 3 yd			DSD	35.
Jordan & Beckham	6 yd	4'-8½"	SSD	Oak still bind bottom	125
Roppel	36"	2 yd	wood		58
	4'-8½	5 yd	wood	roller bearings	182
	"	"	"	SSD	157.50
	"	7 yd			225
	"	5 yd	"	DSD	176.

Locomotives

Apex.	36" gauge 600 tons	hauling load	new	3 200
	standard gauge			3 300
Mitchkum	" " 8 wheel	16x24	(2nd hand)	3 000
	" " 8 "	17x24	"	2 500
Reeking	" " 4 drivers & truck	15½x22		1 650
Forbes & Peckham	" "	20x24		5 500
	" " 6 drivers	40 ton 18x24		4 750
	" " "	20x24		6 000
	" "	32 ton 16x24		4 000
Porter	17 ton 10x16			4 300
	34 ton 14x20			6 400

Box [illegible]
1 Parting board frame
5 [illegible] Screws
[illegible] Screws
2 [illegible] & [illegible] Screw frames
60 × [illegible] = 21.9 cu ft 340#

Box [illegible]
1 Angle plate for lines
1 [illegible]
4 sides Tailings hopper
4 " Cone " "
2 fan casing plates
60 × 43 × 6 = 8.95 307#

#3
4 Fan Sides
6 Fan Casing plates
1 Fan Lip
2 2" Angles Lip [illegible]
2 2½ " Fan " "
4 short 2" Angles
1 Fashioned pulley 2 11/16 bore
1 Robin end pulley " "
#3 short Angles
5 " "
1 Cambric Chute
1 Iron pulley 2 11/16 Bore 4" Diam
1 Short Angle.
53.5 × 53.5 × 12 = 17.2 875#

Box #4
8 Fan Blades
2 2 11/16" Collars
2 2 11/16" Bearings
2 Fan Flanges
36 × 51 × 12 = 12.72 506#

Box #5
1 Feed hopper front
2 " " sides & ends
1 " " angle
1 " " back
1 side side
1 " top
1 Feed hopper angle
4 pcs angle set of sm. legs
2 Hopper gangings
12 × 27 × 108 398#
14.9

#6 Channels and angles
16 pcs.
6 × 22 × 11.5 = 8.65

#7 1 Feed gate with
1 dust screen in frame
5 × 8.5 × 55 65#
1.3.6

#8 1 Accumulator
2 frame ends for same
9 × 13 × 2.1 35#
1.43

#9 1 Fan Shaft
6 × 7 × 94 = 2.3 217

#10 1 Sep Roller feed with shaft
bearing & grease cups
2 Conc. & tails gates
2 side boards of retarding plate
1 Comm for screen & bills
77 × 12 × 10 = .5735 214#

#11 1 Countershaft for Com. feed
with outside pulley bearings
and grease cups
8 pcs together.
1 pc 1" flat 4'-½" rd. belting
6.5 × 8.5 × 55
34#

[illegible]
36 X 35 X 19 = 139 235#

[illegible] Screen Frames
3 X 35 X 19 = 15 2[illegible]#

#[illegible] Screen Frame
36 X 35 X 19 = 13.9 227#

[illegible]
[illegible]
Wooden pulley for bed line
6 X 28 X 78 = 2.73 83#

#16 1 set Patterns
1 Magnet, wire, cord, pulley
T. Key
32 X 20 X 20 = 7.4 192#

#17 1 Screen Roller with shaft bearings, grease, cups.
2 sides of Laboratory gate
2 " " Coal "
3 U pcs
8 bags bolts
1 bundle stay pcs of Sep. sides
1 Screen Hook
12.5 X 14.5 X 80 = 8.4 380

#18 2 pcs Reconcentration
1 pc Sep bottom
2 " Sep sides
1 " " "
12.5 X 34.5 X 59 = 14.8 311

#19 Screens on frames
Screen frames
31.5 X 24 X 19 = 8.35 126#

#20 CMC Personal
15 X 26.5 X 22 = 5.1 91#

#21 1 half of screen chute
91 X 55 X 15.5 = 4.5 430#

#22 1 half of screen chute
16 X 100.5 X 55.5 = 61.5 434#
1 glass door for dep.
10 gross 3/8 X 12 screws
1 pkg 4" screws
2 pkg. 1/4 X 1/2 ft. Hd.
1 pkg 1 1/2 X 8 screws for screens
1 pkg 1/2" belt couplings
3 S wrenches
2 monkey wrenches
1 bicycle wrench
10 gross 1 1/2 X 8 screws
1 Can. grease
1 - 1" belt for roller feed.
part of 600 - screen angle plates
1 lot bags,
1 countersunk punch + die
10.5 X 19 X 29.5 = 3.41 281#

#2 HGK
40 X 37 X 25 = 21.4 200#

#1 HGK
54 X 35 X 26 = 28.5 223#

#3 HGK.
40 X 24 X 20 = 11.1 78#

On Wagon July 14

1st load		2nd load
H.G.K	#1	#18 CMC
H.G.K	#2	3
H.G.K	#3	22
CMC	#15	21
"	#16	17
"	#8	6
"	#11	
"	#7	
"	#9	
"	#4	
"	#1	
"	#10	
"	#2	
"	#5	

10½ X 18 X 55

Box #24

1 roll wire cloth	4 pcs chut iron from old pressure
1 roll drawings	2 boards for screen frame
~~1 cartridge~~	1 lots large + small bags
2 screen sides	1 lot .037 screen
	1 box escutcheon pins
	1 lot cleats for screen + saw joints
	1 lot screen angle plates
	1 nail puller
	60 pcs wood for hand screens
	1 muzzle

#25 L. Salmond personal

15.5 X 29 X 34 = 8.85 165#

#26	1 lot	.150	✓
	1 "	.118	✓
	1 "	.094	✓
	1 "	.074	✓
	1 "	.059	✓
	1 "	.047	✓
	1 "	.007	✓
	1 "	.029	✓

9.5 X 13 X 17.5 = 1.25 125#

Total weight C.M.C cases not including # 24 702 #
Total volume same 295.35 cu ft

Total weight H.G.K cases 50 #
Total volume same 61 cu ft

Box #27 — Screen frame angle plates out of box # 24
1 lot ore bags

Box #24 Assay odds & ends,
1 lot bags
2 lots cupels

Box #28 - Scorifiers
Muffle

29 - Rotary Dries 1 ball twine
1 lot bags Jewels & soap.
1 box for Stitt Giant Crusher
Canvas front for screens.

#30 4 tubs
3 gold dishes
1 box Bags

Order

~~Adz & Handle~~ ~~Barrett~~
~~Brace~~
~~Bits~~
~~Saw~~
~~Plane~~
~~Hammer~~
~~Square~~
~~Level~~
~~6 small plates~~

~~10 lbs Test lead~~
~~1 " pure sheet lead~~
~~2 " borax glass lumps~~
~~1 gross 2" Scorifies~~
~~1 gross 20 gram cupels~~
~~½ oz pure silver foil on thin plate~~
~~2 lbs C. P. Nitric Acid~~
~~1 small pair tweezers for weights~~

2 Cots — 2 bags chaff
2 Mattresses — 2 bu Corn
3 Springs — 1 lamp
Blankets — 1 Oil
Pots & Kettles.
2 Wicker Chairs.
Tea pot
3 pillows
Porridge Pot
1 boiler
1 egg poacher
1 tin skimmer
1 ladle
1 grater.
4 Towels
1 Iron kettle
2 buckets
1 Dish pan
1 frying pan
1 table pan
3 pie dishes
1 wash basin
1 water jug
1 bread dish
Meat Platter
Carving knives

12" Fahrenheit pulley
Bag screws
~~Box screws~~
Bottle box
~~Albany paint #3~~
~~Brush~~
Hand Screen boxes
2 - $1\frac{15}{16}$" Collars
~~4 Gooses 3/4 X 12 Screws P.H.H.~~
1 Can P&B paint
Paint brushes
200 mesh wire cloth.

14X17X23 32-6

John Somay

Notebook, N-03-12-18

[ITEM FOUND IN BOOK]

1903

[ITEM FOUND IN BOOK]

Prof. —

Make following with metals provided by Prof. Ling

Tin — Zinc — Cadmium, Lead — Copper, Silver — Chromium, Selenium

Tellurium, Arsenic, Tungsten, Molybdenum, Vanadium, Titanium

Nickel — Iron — Cobalt — Manganese — Aluminum — Cerium,

Antimony — Red or Amorphous phosphorus, Mercury, Quicksilver solid

Silicon — Bismuth, Platinum, Iridium — Palladium, Rhodium

Iridosmine — Zirconium — Thallium — Tantalum — Ruthenium

Put the metals together on one side —

additional minerals —

Pyromorphite
Peroxide of lead
Galena
Calcopyrite
Tungstate Calcium fuse
Sulphide of Nickel
Stable Nickel ores pyrites
" " groupe
Willimite
Carborundum
Emery
Chromite
Strontium Sulphate fusion.
Balmains Luminous paint.
Crude Barium Sulphate on my desk
Some alleged platinum ore " "

all the Iron ores in glass jars + other places in library

Cassiterite or Stannite

Select different looking samples + make or separate hole for each kind

Break off piece of the Diamond from Blue Mass from the Kimberly Diamond mine —

Also select from the Fluorite in Collection, a sample of the several kinds + make a hole for each —

Don't forget the box of samples where I sent my Fumed volcanic Cinder from Edison N.J. make separate det.

[ITEM FOUND IN BOOK]

[ON BACK OF PRECEDING PAGE]

Cupertino conductor Mahdavi
Barbier, Orig

Notebook, N-05-02-18

05-02-16

CONTENTS OF THIS BOOK.

Test of Iron Wire Resistance Lamp.

Lamp made by Dolley 2/17/05.
It contains about 56 inches of wire made by twisting 2 strands of .004" wire together. When tested on vacuum pump at .400 amps current, it showed 56.7 ohms res.

TIME A.M.	AMPS.	VOLTS	OHMS.	
11.30	.050	.535	10.7	Current at each point for 15 min
	.100	1.215	12.15	
	.150	2.265	15.1	
	.200	4.28	21.4	
	.250	6.90	27.6	
	.300	10.38	34.6	
	.350	14.67	41.75	
	.400	21.2	53	
	.450	25.4	56.4	
2.00 P.M.	.500	34.	68	Glowing bright red

When .500 amps had been on lamp for about 5 minutes, volts at terminals dropped down to 31.7 from 34. I then put current down to .400 again and found the voltage now would not go above 14 and later fell to 12.

3/18/05. – When a lamp is heated up by a flame the H_2O on the glass is vaporized and conducts the heat away from the wire, consequently lowering the resistance of the wire temporarily.

Evidently some change has come about from the heating up at the high rate. Is it caused by occluded gas? Have noticed the same thing when a lamp on the pump was heated up with a flame, i.e. the drop would always go down, but in that case it gradually came up again as the tube cooled off.

3/19/05. – Took CR drop @ 400 amps. again this morning and found it to be 11 volts or 1 volt lower than last time yesterday. I then took readings at different rates again as follows

Amps.	Volts.	Ohms.
.050	.515	10.3
.100	1.035	10.35
.150	1.60	10.67
.200	2.255	11.27
.250	3.15	12.6
.300	4.3	14.33
.350	6.60	18.86

C	E	R	
.400	11	27.5	
.450	19	42.25	
.500	28.9	57.8	
.550	38.7	70.4	Bright red.
.600	49	81.7	
.400	8.44	21.8	1.00 P.M.
"	7.9	19.75	1.40 "

19.75 Ω = 34.8 o/o of original resistance.

The heating up of the wire to high temperature seems to affect its resistance more than anything else. Perhaps the annealing it gets from being heated up by the high current and then cooling slowly as it would in a vacuum, softens it and lowers the resistance in this way.

Iron Wire Sample made by Daley 3/7/05. New .005" wire single. Support 18" long.

Time	Amps.	Volts	Ohms.	
A.M.	.400	34.5	86.2	on pump.
11.00	.300	16.5		
	400	34.2		
"	.500	60.8		
11.10 P.M.	.400	31.4		
1.45	"	27		
5.40 A.M.		23.7		
7.00	"	20		3/8
8.20	.500	43.7		
9.00	"	37.1		
10.45 P.M.	"	32		
3.00	"	29		
"	.400	13	32.5	
4.30 A.M.	"	12.7		
7.00	"	12.6		3/9
10.00	"	12.7	31.7	

Put on pump again and heated up to red for ½ hour.

(OVER)

3/19/05. The fall in resistance cannot come from softening of the wire because in that case it would not come up again when the lamp was re-exhausted.

It is evident that something gets in which conducts the heat away. It is most likely that when the wire is heated up, gases which have been occluded by the Fe are slowly driven off and practically fill the vaccuum. I should think however that there could be nearly all gotten rid of by the second exhausting.

11.10 A.M.	.400	34.2	85.5	3/9/05	
1.10 P.M.	"	29.7			
"	.460	44.3			
3.15	"	31.9			
5.50	.400	17.2			
8.50 A.M.	"	16.5		3/10	
"	.480	32			
10.30	"	29.7			
"	.500	35			
5.10	"	28			
"	.400	13.3			
8.30 A.M.	"	12.6		3/11	
2.15 P.M.	"	13			
"	.500	29			
7.10 A.M.	"	28.7		3/12	
4.40 P.M.	"	26.2			
8.20 A.M.	"	28		3/13	
"	.400	12.8		off	
	Stood	26 hrs.			
10.15 A.M.	.400	12.8	32	3/14	

Filled lamp with hydrogen then put on pump and kept wire heated up to red while exhausting.

(over)

P.M. 6.00	.400	34	85	3/15/05
A.M. 8.40	"	31.5		3/16
"	.450	43.6		
9.20	"	42.5		
"	.500	57.2		
10.30	"	50		
P.M. 7.00	"	39.8		
A.M. 9.00	"	39		3/17
"	.400	17.3		
P.M. 1.00	"	16.4		
"	.500	39.8		
4.00	"	38.2		
"	.400	17		off
A.M. 8.30	.400	16		3/18
"	.500	39		
P.M. 5.20	"	34		
"	.400	14		
A.M. 9.00	"	14.8		3/20
"	.500	39		
A.M. 8.30	"	39		3/21
"	.400	16.8		
10.00	"	16		
P.M. 12.30	"	16	40	off

New Tantalum Incandescent Lamp.
Frosted. 110 V. 25 C.P. 14 watts
22 B.C.P.

Tested at different amperes to get the effect of temperature on the resistance.

Amps.	Volts #1	Volts. #2	Ohms #1	Ohms. #2.	
.150	33	31.5	220	210	
.200	49.6	46.9	248	234.5	
.250	68.2	64	272.7	256	
.300	87.8	82.6	292.7	275.4	
.350	107.8	101.5	308	290	
.356	110		309		1.78 watts per B.C.P.
.372		110		295.8	1.96 " " "

Put the two lamps in multiple to see if we could see them for resistance on the small cell Endurance.

.350	40.9	116.8	
.400	49.2	123	
.450	58	128.8	
.500	67	134	

3/23/05.

Resistance in air of .003" Pt wire. Used 30.5 inches.

.200 amps.	9 V. drop	=	45 Ω	resistance
.300 "	14 "	=	46.6	"
.400 "	19.4 "	=	48.5	"
.500 "	25.9 "	=	51.8	"

Lamp made of #34 (.0063"). Climax Resistance wire. 15" support = about 61.5" of wire.

.200 amps.	16.2 V.	= 81 ω	no.	
.300 "	25.4 "	= 84.5 "		
.400 "	35 "	= 87.5 "		
" "	34.5 "	= 86.2 "	after 1½ hrs.	
" "	34.5 "	= 86.2 "	" " 2 days.	

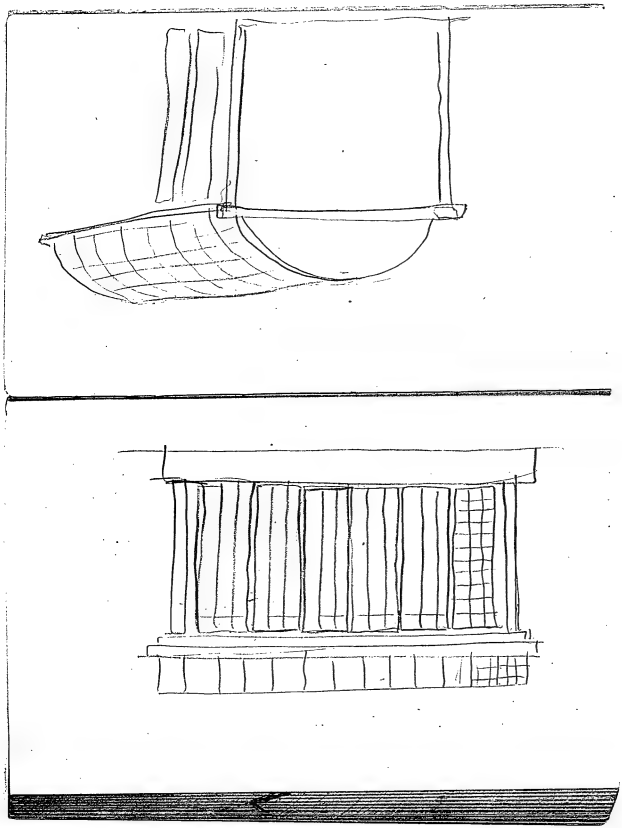
New Edison Lamps.

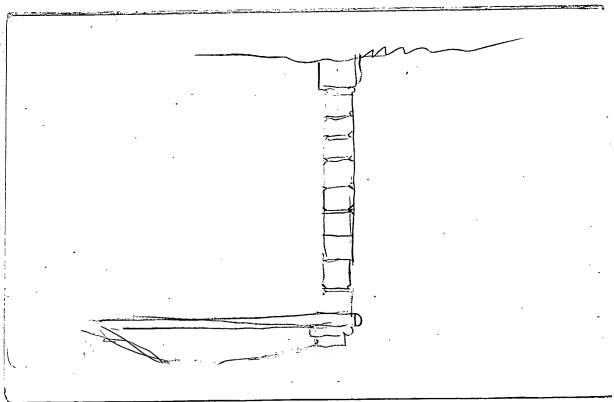
80 V. 16 C.P.

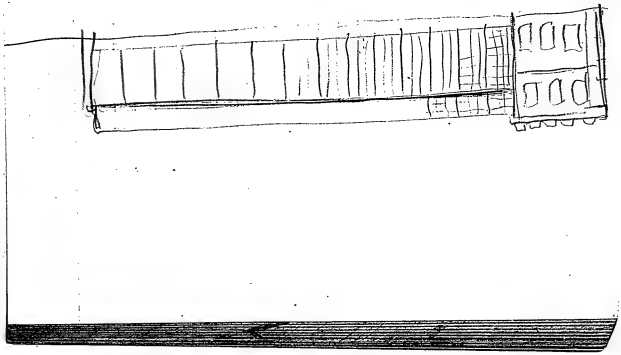
Mil-Amps.	Volts #1	Volts #2	Volts #3	Ohms #1	
100	14.6	13.4	14.2	146	
200	25.2	23.8	24.7	126	
300	35.8	34.2	35.2	119.3	
400	46.3	45.2	45.7	115.7	
500	57.1	56.9	56.8	114.2	
707	80			113.9	
698		80			
708			80		

Watts per C.P. #1 = 3.51

Notebook, N-06-11-21







Notebook, N-05-00-00.5

Experiments in Stereoscopic
Photography & Lantern projection

Made stereoscopic pairs of pictures
with an ordinary camera using
a board on tripod with a slide
giving 3" motion & ~~used~~ used this
for ordinary views
For close pictures of small
objects kept the camera stationary
& rotated the object on a turntable
about 10° of the circle
Pairs made by both of these methods
showed good relief on a stereoscope.
Made pairs of lantern slides from
these negatives & projected on a
screen in almost exact register
by regarding one through the red glass
& the other through a green glass
& used simulacra colored glass
over the eyes used the green glass
over the left picture & left eye
& red over right picture & eye
found that the colors did not
balance at all the red altogether
too dull & the green picture could
be seen through the red glass

SAFRANINE →

SAFRANINE →
[illegible] dye
L.A. Burt
1/16/1999

stronger than the red picture

Fixed out & washed a lot of old slides & stained with different strength of the following colours acid green, naphthol green, safranin, erythrosin after considerable experiment chose the following stains.

For the ~~[illegible]~~ projecting glass

acid green 3% 5 minutes

For the green spectacle glass.

acid green 1% 5 minutes

For the red glass both projecting & viewing

Safranin ½ % 2 minutes

This combination made each eye see a different picture & picture only if the colours were used any lighter the other picture began to be slightly visible

the sense of relief with this ~~[illegible]~~ combination is excellent & the resulting picture fairly white though the eyes change a little the picture is at times red at times green.

Spectroscopic examination of the stained glass.

Ordinary red glass passes red orange & a slight yellow the red considerably diminished

~~Ordinary green glass~~ passes the green a little diminished, most of the yellow ~~& at least~~ extends at least half way into the red & also passes some distance into the blue

Erythrosine 1% stained 10 minutes passes the red full strength most of the yellow completely blocks out the green except a very slight bluish green passes considerable blue & the extreme violet is almost untouched

Naphthol green 3% 5 to 10 minutes

all the colours passed are dulled quite a lot

passes a narrow strip of red close to the yellow, passes yellow green & so far into blue but all colours dull

Naphthol green 1% 5 minutes
Throws the whole spectrum from dark blue to about half way through the red

Lyganin ½% 10 minutes.

Passes the red & a little yellow up to the faintest suspicion of green the red is distinctly brighter than with ~~other~~ red glass. careful looking shows a bright band of very faint violet

Acid green 3% 10 minutes
Passes a dull narrow band in the green red cuts off all the light red orange & yellow passes the green to blue about half way into the violet

Spectrum of the colours used

the green projecting glass

Acid green 3% 5 minutes

Passes a little violet the green & blue almost unaltered some yellow & just a suggestion of orange then comes a perfectly black band in the red & a ~~[illegible]~~ certain amount of light passed in the extreme red

the green spectacle glass.

Acid green 1% 5 minutes

Similar to the last but the ~~[illegible]~~ green band is both a little broader & brighter the absorption band in the red is narrower but is still absolutely black the light on the green side of the black band shows a little more of the orange.

The red projection glass.

Toffranin ½% 2 minutes

Passes the whole of the red & orange gradually undermined shows a band of the red end of the greens then the green & blue are completely blocked out & a faint but very broad band shows in the violets

Notebook, N-07-06-17

07-06-17

Order Number 1939.

June 17, 1907.

Resistance Measurements of Thin Films of Metals Plated on Glass by Convection Currents.

Section of film measured will be in each case $\frac{3}{4}$" wide and 1 inch long between contact terminals.

Contact terminals consist of heavy copper sheets cemented on glass with their edges parallel and exactly one inch apart. Three layers of tinfoil are clamped on top of these to form a cushion on which to lay the glass coated with metal. A weight is then placed on top of the glass.

Apparatus.

Ordinary Post-Office Bridge connected up on Wheatstone principle with five storage cells and a D'Arsonval galvanometer.

Galvanometer is provided with a mirror which reflects a ray of light onto a scale at a radius of about 53 inches.

June 17, 1907.

Connected up a coil of known resistance to measure, and check up the bridge. Took following readings:—

1000 : 1000 = 84 : x

1000 : 100 = 963 : x

1000 : 10 = 7/0 balance —

Great variation of galvanometer when plugs are all in "C". This shows that 10 Ω coil on "B" is disconnected or broken.

This bridge is 7/0 g.

Readings on B. bridge #2.

10 : 10 = 98 - : x
100 : 100 = 98 - : x
1000 : 1000 = 98 - : x
1000 : 100 = 979 : x
1000 : 10 = 9787 : x

Bridge #2 seems to be O.K.

June 18, 1907.

Connected a standard ohm-mp with about 2 feet of lamp cord. Results –

1000 : 10 = 102.5 : x
x = 1.025 ω

Value is high because temperature is 24°C instead of 15° as prescribed and also on account of the lamp cord and contacts in circuit.

June 19, 1907.

Said heavy copper strip, the same size as the glasses, across terminals to measure resistance of the connecting wires and contacts.

Results:—

With pressure of 335 grams

$1000 : 10 = 1.7 : x$

$x = .017\ \Omega$

With pressure of 1075 grams

$1000 : 10 = 1 : x$

$x = .01\ \Omega$

Opaque film

6/19/07.

J.A.T. #7.

Platinum - $3\frac{3}{4}$ hrs. plating

Plate #1.

Pressure 335 grams

1000 : 10 = 506 : x

x = 5.06 ohms.

Plate #2.

Pressure 335 grams.

1000 : 10 = 83.8 : x

x = 8.38 ω

Plate #3

Pressure 335 grams.

1000 : 10 = 70.5 : x

x = 7.05 ω

Plate #4.

Pressure 335 grams.

1000 : 10 = 190.8 : x

x = 19.08 ω

Hard to balance galvanometer - Resistance of contact between film + foil must vary.

6/19/07.

Platinum - $3\frac{3}{4}$ hrs. plating

Repeat previous test and also test using more pressure

Plate #1.

Pressure 335 grams

1000 : 10 = 1800 : x

x = 18 ω

Did not disturb plate but tried again a few minutes later -

1000 : 10 = 870 : x

x = 8.7 ω

Kept key pressed down and adjusted galvanometer to 0 instead of taking instantaneous reading -

1000 : 10 = 850 : x

x = 8.50 ω

Instantaneous reading few minutes later again -

1000 : 10 = 872 : x

x = 8.72 ω

6/19/07.

Platinum - 3 $\frac{3}{4}$ hrs. plating

Plate #1.

Pressure 1152 grams
1000 : 10 = 630 : x
x = 6.3 ω

Still hard to balance galvanometer. If key is held down galv. will approximately assume a constant position and then suddenly it will oscillate vigorously for no evident reason.

Pressure 2127 grams
1000 : 10 = 598 : x
x = 5.98 ω

Pressure 3267 grams
1000 : 10 = 565 : x
x = 5.65 ω

These pressures give fairly constant results.

6.22
8.19
6.46
6.52
4) 27.39
6.847 ω average of values

on opposite page for Platinum

plated 3 3/4 hrs. (Momentary method)

Film is opaque.
Color is white but is tinged here and there with straw color.
Makes a perfect mirror.

6/19/07.

Platinum – 3 3/4 hrs. plating

Pressure in each case 2450 g.

Plate #1.
Momentary current = 6.22 ω
Continuous " = 6.00 ω

Plate #2.
Momentary current = 8.19 ω
Continuous " = 8.40 ω

Plate #3.
Momentary current = 6.46 ω
Continuous " = 7.36 ω

Plate #4.
Momentary current = 6.52 ω
Continuous " = 6.50 ω

Momentary current method is most convenient and values seem to be fairly constant as hereafter that method will used.

6/19/07.

Platinum 1 mm² in section by 1 meter long, resistance = .0898 Ω

R of same section but 1 inch long = .0898 × .0254 = .00228092 Ω.

But R of film 1 inch long was found to be 6.847 Ω or 3001.85 times this value –

∴ The section area of the film is $\frac{1}{3001.85}$ = .0003331 mm².

Film is approximately $\frac{3}{4}$ inch wide or 19.05 mm.

∴ Its thickness would be $\frac{.0003331}{19.05}$ = .0000174 8 mm.

Or .0000174 8 × .03937 = .000000 68818 inches thick.

```
.0898
.0254
 35 92
 4490
 1796
.00228092) 6.847000000 | 3001.85
           6 84 7 2 7
             4 7 4 0 0 0
             2 2 8 0 9 2
             1 9 5 9 0 8 0
             1 8 2 4 7 3 6
               1 3 4 3 4 4 0
               1 1 4 0 4 6 0
               2 0 2 9 5 0
3001.85) 1.000000 | .0003331 mm²
         9 0 0 5 8 5
           9 9 4 4 5 0
           9 0 0 5 5 5
             9 3 9 5 5 0
             9 0 0 5 5 5
               3 8 3 9 5 0
               3 0 0 1 8 5

19.05) .0003331 | .0000174 8 mm
       1 9 0 5
         1 4 2 6 0
         1 3 3 3 5
           9 2 5 0
           7 6 2 0
           1 6 3 0 0
           1 5 2 4 0

.0000174 8
 .03937
 1 2 7 3 6
 5 2 4 4
 1 5 7 3 2
 5 2 4 4
.000000 6 8 8 1 8 7 6 in.
```

Opaque film except at ends;
a few scratches and specks
can be seen.
Color is minute-hinged white
straw-color same as $3\frac{3}{4}$ hr.
plate. Film on one side has
mottled appearance.

June 20, 1907.

Platinum - 2 hrs. plating
J.A.T. #8.

Pressure in each case 2450 g.

Plate #1.	8.12 ω
Plate #2.	14.65 ω
Plate #3.	9.61 ω
Plate #4.	10.62 ω

4)43.00

Average - 10.75 ω

These films are translucent.

#1 has few pinholes
#2 " many "
#3 " long scratches & pinholes
#4 " pinholes

There is metal plated on both sides of glass of all the slides, but the back coating is very thin.

Will measure both sides hereafter so as to be sure of getting the right one.

Looks bluish brown by transmitted light.

6/20/07.

Platinum - 1 hr. plating
J.A.T. #9.

Pressure 2450 grams.

Plate #1.	Front	18.38	
	Back		111.2
Plate #2.	Front	29.63	
	Back		52.23
Plate #3.	Front	17.73	
	Back		53.48
Plate #4.	Front	24.49	
	Back		63.01
		4/90.22	
Average		22.555	w

These are very uniform films.

#1 - Very few pinholes.

2 - Perfect coating - no pinholes

3 - Very few pinholes.

4 - " " "

Film is just transparent.

Spots white - imaged with smoky blue by reflected light.

Spots bluish brown by transmitted light.

6/20/07.

Platinum - ½ hr floating

J.A.T. #10.

Pressure 24.5.0 grams.

Plate #1. Front 34.67

Back 94.51

Plate #2. Front 39.21

Back 84.50

Plate #3 Front 45.83

Back 77.88

Plate #4 Front 41.22

Back 40.22

4 | 160.88

Average 40.22 w

Very transparent films of great uniformity. All looked exactly alike. Colors same as ½ hr. film, only thinner. Repeated measurements on plate #3 three times and got practically the same result each time. For some reason it must have a heavier coating on the back than the others have.

6/20/07.

Platinum - 15 min. plating
T.A.3. #11.

Pressure 2450 g.

Plate #1. Front 140.
Back 1872

Plate #2. Front 140.3
Back 1708

Plate #3. Front 207.7
Back 445.4

Plate #4. Front 211.7
Back 1584

4 | 703.7
Average 175.9 w

Very transparent.
Colors by reflected and transmitted light same as 15 min film only - thinner.

6/20/07.

Platinum - 7½ min. plating
J.A.T. #12.

Pressure 2450 g.

Plate #1. Front 168.3
Back 33390

Plate #2. Front 140.2
Back 69990

Plate #3. Front 157.8
Back 515000

Plate #4 Front 134.8
Back 15040

4) 601.1
Average 150.27

A very slight coloration of the glass can barely be seen.

With resistances on bridge arranged to give highest possible measurement - i.e. 10 : 1100 = 10.000 : x — galvanometer was still deflected to the low side.

The deflection in each case was 29 mm, which was found to be the same amount as when no connection was made across the contact terminals except thru the air and the glass support.

This shows that the resistance of the one minute platinum film is infinite.

June 21, 1907.

Platinum - 1 min plating.
J.A.T. #13.

Pressure 2450 g.

Plate #1. Front } Greater than
Back } 1,100,000 ohms

Plate #2. Front } Same
Back }

Plate #3. Front } Same
Back }

Plate #4. Front } Same
Back }

6/21/07.

Tabulated Results on Plottinen.
J. a. 3. #7 - 13.

All micropsed under pressure of 7450 ozs.

Average taken of four plotts in each case.

7	Plotted	3 7/8	hrs.	Broth Coating	=	6.847 w
8	"	2	"	"	"	10.75
9	"	1	"	"	"	22.55
10	"	1/2	"	"	"	40.22
11	"	15	mins.	"	"	17.5.9
12	"	7 1/2	"	"	"	150.29
13	"	1	"	"	"	Infinite

Opaque film
makes a perfect mirror.
Metal is white by reflected light
but has blinds gray markings
on the backs.

6/21/07.

Nickel - 4 hours plating.
J.A.T. #2.

Pressure 2450 grams.

	Front	Back
Plate #1	6.27	14.94
Plate #2	4.96	15.76
Plate #3	7.42	24.59
Plate #4	6.87	12.50
	4) 25.52	
Average	6.38	.W

Transparent.
Film looks brown by trans-
mitted light.
By reflected light it is white
just tinted with yellow.

6/21/07.

Nickel - 2 hrs. plating
J.A.Z. #3.

Pressure 2450 grams.

	Front	Back
Plate #1.	57.78	654.5.
Plate #2.	57.88	749.8
Plate #3.	48.16	147.5.
Plate #4	25.47	190.0
	4 | 184.29	
Average -	46.07	W

6/21/07.

Nickel - 1 hr. plating
J.A.B. #4.

Pressure 7450 grams.

	Front	Back
Plate #1.	421.3	769.3
Plate #2.	1153	2332.
Plate #3.	697	500.5
Plate #4.	139.6	298.7
	4) 743.57	
Average	185.89	0

6/21/07.

Nickel - ½ hr. plating
J.a.z # 5.

Pressure 2450 grams

	Anodic	Back
Plate #1.	469.8	225000
Plate #2.	429.0	29000
Plate #3.	341.9	1902
Plate #4.	357.2	154000

4 | 1597.9

Average 399.47 w

6/21/07.

Nickel - 15 min. plating
T.A.Z. #6

Pressure 2450 grams

	Front	Back
Plate #1.	7157	Over 1,000,000
Plate #2.	2406	"
Plate #3.	4453	"
Plate #4.	4480	"
	18496	
Average	4624	"

4/21/07.

Tabulated Results on Wheel
T.a.3. #2-6.

All measured under pressure of 2450 grams

Averages of the four plates-

#2 Plotted 4 lbs. Trowel Coating = 6.392
3 " 2 " " " = 46.09
4 " 1 " " " = 195.89
5 " ½ " " " = 399.47
6 " ¼ " " " = 4674.0

These are all more or less oxidized.

Film on front is pinkish violet but it is not oxidized right down to the glass as a patch of pure copper color shows thru the glass from the back.

Film is opaque.

June 24, 1907.

Copper - 4 hrs. plating.
Exp. #14.

Pressure 2450 grams.

	Front	Back
Plate #1	.585	.87
Plate #2	.39	.515
Plate #3	.315	.46
Plate #4	.525	.775
	4 | 1.797	
Average	.449 ω	

All more or less oxidized.
Translucent.
Scale pinkish violet by reflected light + greenish black by transmitted light. Van-colored bands on back.
Plate #2 is not oxidized as badly as the others and looks reddish violet by transmitted light.
All the plates have pinholes and #3 + #4 are scratched badly.

6/24/07.

Copper - 2 hrs. plating
Exp. #15.

Pressure - 2450 grams

	Front	Back
Plate #1.	16.48	0.m 1000.000
Plate #2.	7.21	"
Plate #3.	11.76	"
Plate #4.	12.79	"
	48.24	
Average	12.06	"

Transparent Films.

As seen by reflected light, films have a complex coloring. There is some bright yellow on the edges and pale blue with traces of red in the center. There is also a tinge of green where the yellow merges into the blue.

By transmitted light the main part of the film looks greenish yellow and the edges brownish yellow.

There are some scratches and pinholes on all of these and #3 has a mottled appearance.

June 25, 1907.

Copper - 1 hr. plating
Exp. #16.

Pressure - 7450 grams.

	Front	Back
Plate #1.	0mm 1.000.000.	0mm 1.000.000
Plate #2.	"	"
Plate #3.	"	"
Plate #4.	"	"

Front and back in each case measured more than 1.000.000 ohms.

These are transparent but not so much as the first one, hour set. This is because they are oxidized more than the first ones.

By reflected light one side of plate appears fairly uniform bluish blue with a border of yellow, red, blue + green. This is probably the back side. The other side is very beautiful. It has a little yellow in the center - then comes the main point which is red. This has a border all around consisting of blue merging into green and then yellow again.

By transmitted light center of plate is yellowish green and edge is pure yellow.

6/25/07.

Copper - 1 hr. plating
Exp. #17.

Pressure 2450 grams

	Front	Back
Plate #1.	Over 1.000.000.	Over 1.000.000
Plate #2.	"	"
Plate #3.	"	"
Plate #4.	"	"

Front and back in each case measured more than 1.000.000 ohms.

Transparent films not quite as heavy as #17.

By reflected light the colors of the front and back correspond to those of #17 only they are in no regular order from center to edge but are very much mixed up. Blue seems to predominate rather than red and the film has a heterogeneous, mottled appearance.

By transmitted light film is greenish yellow with blotches of green in central part.

Could see no difference between #4, which had comparatively low resistance, and the others except that it is perhaps more mottled.

6/25/07.

Copper - 1 hr. plating.
Exp. # 18.

Pressure 2450 grams.

	Front	Back
Plate # 1.	18500	Over 1000000
Plate # 2.	884000	"
Plate # 3.	Over 1000000	"
Plate # 4.	57.35	"
	4 | 1.90355.35	
Average	475639.33	"

Very transparent.
Looks a very pale blue with tinges of straw color by reflected light.
Scarcely any color can be seen by strong transmitted light but if plate is laid on white paper it is seen to have a delicate yellow color with just a suggestion of green.

6/25/07.

Copper - ½ hr. plating
Exp. # 19.

Pressure 24.50 grams.

	Front	Back
Plate # 1.	Over 1000 000.	Over 1.000 000.
Plate # 2.	"	"
Plate # 3.	"	"
Plate # 4.	"	"

Film blue-tinged with yellow by reflected light.

When laid on white paper it appears bluish green with tinges of yellow.

Very transparent but not so much so as #19 on account of the different color.

6/25/07.

Copper - ½ hr. plating.
Exp. # 20.

Pressure 2450 grams.

	Front	Back
Plate # 1.	731.8	Over 1000.000
Plate # 2.	540.9	"
Plate # 3.	192.8	"
Plate # 4.	343.0	"
	4 | 1808.5	
Average	452.1	"

Very transparent and clear.
Misty blue by reflected light.
When laid on white paper
it appears pale orange in
color.

6/25/07.

Copper - ½ hr. plating
Exp. # 21

Pressure 2450 grams.

	Front	Back
Plate # 1.	Over 1000.000	Over 1.000.000
Plate # 2.	"	"
Plate # 3.	"	"
Plate # 4.	"	"

June 26, 1907.

Tabulated Results on Copper
Exp.ts 14 - 21.

Contact Pressure 2450 grams.

Each figure is the average of four plates - front coating.

#14.	Plated 4 hrs.	.449	ω
15.	" 2 "	12.06	"
16.	" 1 "	Infinite	
17.	" " "	"	
18.	" " "	49,563,9.33	"
19.	" ½ "	Infinite	
20.	" " "	4.572	"
21.	" " "	Infinite	

The different degrees of oxidation of the copper probably accounts for these irregular results.

Transluscent

By reflected light the film is white but is stained considerably with brown, especially on the front.

By transmitted light the color is brownish blue.

6/26/07.

Bismuth – 1 hr. plating
Exp. #24.

Contact Pressure 245.0 grams.

	Front	Back
Plate #1.	329.0	868.3
Plate #2.	306.7	688.2
Plate #3.	317.6	632.8
Plate #4.	263.0	499.5
	4 | 1306.3	
Average	326.5.7	ω

Transparent
Both sides look bluish brown
by reflected light.
Looks bluish blue by
transmitted light.

6/26/07.

Bismuth – ½ in. plating.
Exp. #25.

Contact Pressure 2450 grams.

	From	Beside
Plate #1.	Over 1000000.	Over 1000000.
Plate #2.	"	"
Plate #3.	"	"
Plate #4.	"	"

Looks like clear white glass but a closer examination reveals a very delicate bluish white film.

6/26/07.

Bismuth & Cu. plating.
Exp. #26.

Contact Pressure 2450 grams.

	Front	Back
Plate #1.	Ohm 1.000.000.	Ohm 1.000.000.
Plate #2.	"	"
Plate #3.	"	"
Plate #4.	"	"

6/26/07.

Results on Bismuth
Exp. #24 - 26.

Contact Pressure 2450 grams.

Average for the four plates
of each set - front coating.

#24	Plated	1 in.	326.57 Ω
25	"	½ "	Infinite
26	"	¼ "	"

Film is transparent.
Film has tints of blue & yellow by reflected light and looks reddish brown by transmitted light.

6/26/07.

Tungsten - 12 hrs. plotting
Exp. # 73.

Contact Pressure 2450 grams.

	Front	Back
Plate #1.	575.8	440500
Plate #2.	415.0	28770
Plate #3.	414.5	19390
Plate #4.	330.6	45000

4 | 1735.9

Average 433.97 W

Transparent film.

By reflected light, film has an even pale blue tint on both sides.

By transmitted light it is a made brown color.

6/26/07.

Image ten - 4 lns. plotting.
Exp. = 32.

Contact Pressure 2450 grams.

	Front	Back
Plate #1.	995.5	Over 1000.000
Plate #2.	826.6	995.000
Plate #3.	664.7	148.400
Plate #4.	887.6	Over 1000.000
4	3364.4	
Average	841.1	W.

Radium Effect.

June 27, 1907.

Platinum 3 3/4 hrs. Plate #1. Reg. Press.
R by Closed Circuit Method 5.00 ω
Kept entirely closed and brought tube of Radium beneath the glass support and about 1/2 inch below the metallic film. It did not affect the balance of the galvanometer.

Platinum 1 hr. Plate #1. Reg. Press.
R by Closed Circuit Method 71.50 ω
Subjected to influence of Radium as above with no effect on resistance.

Platinum 15 min. Plate #1. Reg. Press.
R by Closed Circuit Method 149.8 ω
Resistance unaffected by Radium emanations.

6/27/07.

Nickel 2 lbs. Plate #1. Reg. Press.
R by Closed Circuit Method 49.8 ω
Subjected to influence of Radium
as Platinum was subjected be-
fore, and found that conduct-
ivity of the Nickel remained
unchanged.

Copper 2 lbs. Plate #1. Reg. Press.
R by Closed Circuit Method 15.75 ω
Conductivity unaffected by
influence of Radium.

Bismuth 1 lb. Plate #1. Reg. Press.
R by Closed Circuit Method 250 ω
Conductivity unaffected by
influence of Radium.

Tungsten, 12 lbs. Plate #1. Reg. Press.
R by Closed Circuit Method 331 ω
Conductivity unaffected by
influence of Radium.

June 28, 1909.

Focused a direct vision spectroscope on an acetylene flame to get a continuous spectrum, and then placed transparent films of various metals in front of slit to see if they gave any absorption lines.

Results —

Platinum.
Dim white spectrum. No dark lines visible.

Nickel.
Same as above.

Copper.
Same

Bismuth.
Same

Tungsten.
Same

Transparent Film

By reflected light film looks brown in center of plate and bluish gray at the edges.

By transmitted light it is light brown in center and dark brown at the edges.

June 29, 1907.

Resistance Measurement.

Iron -12 lbs. plating.

Exp. #27.

Contact Pressure 2450 grams.

	Front	Back
Plate #1.	614.8	1249.0
Plate #2.	935.0	910.0
Plate #3.	1328.0	562.1
Plate #4.	928.0	1112
	4 | 3705.8	
Average	926.4 ω	

White by reflected light
Makes a very fine mirror.
Film is just translucent to
strong light.
Color by transmitted light
is pure blue.

6/29/07.

Resistance Measurement.
Silver - 45 min. plating.
Exp. #28.
Contact Pressure 2450 grams.

	Front	Back
Plate #1.	1.63	11.88
Plate #2.	2.18	7.07
Plate #3.	1.62	3.63
Plate #4.	1.43	12.29
	4 | 6.86	
Average	1.715 ω	

July 1, 1907.

Effect of Magnetism on Resistance.

Used the large electromagnet across the 120 volt line, making a very strong field. Spread pole pieces as far apart as they would go (about 2 1/4"), and laid the contact plate on a sheet of mica on top of the poles so that the metal film would come over the gap.

Had to use heavy lamp cord to connect from terminals to bridge.

Resistance of wires and contacts with a piece of copper, under pressure of 2535 grams, short-circuiting terminals, was .024 ω. This value was unaffected by magnetism.

For accurate work this amount should be subtracted from the values given on the following pages.

7/1/07.

Effect of Magnetism on Resistance.
Contact Pressure 2.535 grams.
Nickel.

4 In. - Plate #1.

Resistance 5.35 Ω. Very slightly affected by magnetic field - not enough to measure. If contact key is held down until galvanometer balanced, and magnetizing current suddenly is closed, galvanometer will be deflected about 10 mm. to the low side showing that resistance of Ni is increased slightly in a magnetic field. When field is thrown off again with contact key still down, galvanometer does not swing back to zero immediately but comes rather slowly.

2 In. - Plate #1.

Resistance 39.61 Ω.

The resistance of this film did not seem to be affected an

7/1/07.

the least by magnetism. Galvanometer balance was not disturbed appreciably when current was switched on and off thru field coils.

1 hr. Plate #1. Ni
Resistance 306.2 Ω
Resistance remains the same in the magnetic field – same result as with the 2 hr. plating

½ hr. Plate #1. Ni
Resistance 339 Ω – Unaffected by magnetism.

Repeated experiment on the 4 hr. plating and got same result as before i.e. – resistance was slightly higher in the field. – This result was obtained with the magnetic lines of force running lengthwise of the film that is, parallel with the current.

7/1/07.

You tried the same 4 in. Nickel film with the lines of force running across the film or perpendicular to the current. Result – the resistance was not affected by magnetism running in this direction.

Also on the same film, tried the effect of reversing the direction of the magnetic flux with respect to the flow of current thru the film – when the lines of force were parallel to the current as originally. Result – the deflection of the galvanometer was to the low side as before, showing that the resistance of the film was slightly increased when the film was traversed lengthwise by magnetic lines in either direction, and that the resistance was unaffected by magnetic lines traversing it crosswise.

7/1/07.

Platinum. 3 3/4 lns. Plate #1.
Resistance 7.3 ω. Unaffected by magnetic flux in either direction.

Platinum. 2 lns. Plate #1.
Resistance 8.68 ω. Unaffected by magnetic flux in either direction.

Platinum. 1/2 ln. Plate #1.
Resistance 28.48 ω. Unaffected by magnetic flux in either direction.

Copper. 4 lns. Plate #1.
Resistance .66 ω. Unaffected by magnetic flux in either direction.

Copper. 2 lns. Plate #1.
Resistance 19.90 ω. Unaffected by magnetic flux in either direction.

7/1/07.

Tungsten. 12 hrs. Plate #1.
Resistance 378.4 Ω. Unaffected by magnetic flux in either direction.

Tungsten. 4 hrs. Plate #1.
Resistance 1331 Ω. Unaffected by magnetic flux in either direction.

Bismuth. 1 hr. Plate #1.
Resistance 348.7 Ω. Unaffected by magnetic flux in either direction.

Iron. 12 hrs. Plate #1.
Resistance 1281 Ω. Unaffected by magnetic flux in either direction.

Silver. 45 min. Plate #1.
Resistance 7.79 Ω. Unaffected by magnetic flux in either direction.

July 3, 1907.

Absorption Spectra.

Silver. 45 min. Plate #1.

This is the one that looks deep blue by transmitted light.

Film is too dense to pass a bright spectrum when it is interposed between slit and flame.

A little red and orange shows up dimly. Hardly any yellow shows but green and blue are quite bright. Violet can just be made out.

No dark lines are visible.

Plates #2, 3, & 4 corresponded with plate #1.

Silver. 22 min.

Film is quite thin and when one plate only was interposed, spectrum was just dimmed very slightly. Two plates increased the effect

7/3/97

and the yellow seemed to be absorbed more than the other colors. No dark lines were visible.

Silver. 11 min.

Three plates interposed at once merely dimmed the whole spectrum. No dark lines.

Silver. 5 min.

Four plates interposed merely dim the whole spectrum.

Silver. 30 min.

Saw a blue by transmitted light but could not make out any absorption effects with the spectroscope. All the colors were dimmed uniformly.

7/3/07.

The methods tried for absorption spectra on June 28th, I now tried over again using thicker films - as the results obtained then were on the thinner plates.

Methods tried were -

Nickel
Platinum
Copper
Magnesium
Bismuth
Iron

There was no change in the results i.e. - they all dimmed the whole spectrum without regard to the colors. Even the copper films which were some of them highly colored when viewed by transmitted light showed no appreciable selective absorption.

See next page.

July 5, 1907.

Resistance Measurement.

Silver. 22 min. plating.
Exp. # 29.
Contact Pressure 2450 grams.

	Front	Back
Plate # 1.	Over 1.000.000.	Over 1.000.000.
Plate # 2.	"	"
Plate # 3.	"	"
Plate # 4.	"	"

Deposit rubs off very easily.
Plate #1 was scratched considerably by brushing with a camel-hair brush.
By reflected light, color is white tinted with blue, pink, + yellow.
Pinkish-brown by transmitted light.

Pale blue, pink and brown-color by reflected light.
By transmitted light color is greenish blue in thinner parts and pinkish brown in thicker parts of film.

Same colors as #30 by reflected and transmitted light only thinner.

7/5/07

Resistance Continued.

Silver, 22 min plating
Exp. #29
Contact Pressure 2450 grams.
Front and back coatings of all four plates measure more than 1,000,000 ohms.

Silver, 11 min plating
Exp. #30
Contact Pressure 2450 grams.
Front and back coatings of all four plates measure more than 1,000,000 Ω.

Silver, 5 min plating
Exp #31
Contact Pressure 2450 grams.
Front and back coatings of all four plates measure more than 1,000,000 Ω.

By reflected light, film is white with slight tinges of blue and pink.
By transmitted light it is blue and violet.
Transparent Film.

7/5/07.

Resistance Continued.

Silver. 30 min plating.
Exp. #32.
Contact Pressure 2450 grams.

	Front	Back
Plate #1.	9.49 ω	Omega 1000.000.
Plate #2.	5.47	"
Plate #3.	9.71	"
Plate #4.	111.8	"

Average of Plates #1, 2, + 3 = 8.20 ω

By reflected light film is straw color with tinges of blue and pink.
By transmitted light film is blue and violet.

By reflected light film is straw color with here and there a small blue spot.
By transmitted light film is blue and the same spots are yellowish.

7/5/07.

Resistance Continued.

Silver. 5 min. plating - after current was passed for 1 hr to get rid of all traces of oxygen. Exp. #33.
Single slide was placed in middle of tube. Rubbed the deposit off of the edges so as to disconnect the two sides. Resistance, using usual contact pressure of 2450 grams, then was -

One Side 19.43 Ω.

Other Side 21.39 Ω.

Silver. 2 min. plating after apparatus free of oxygen as above. Exp. #34.
Contact pressure 2450 grams.
Both films have more than 1000000 ohms resistance.

7/5/07.

Effect of Magnetism on R.

Had a brass clamp made to press plates on contact terminals, instead of using wingnuts, so that film could be put between the poles of magnet edgewise - that is, so that the plane of the film is perpendicular to the magnetic lines of force. Pole pieces of magnet are about one inch apart.

Contact pressure is unknown but it is the same for both readings on the same film.

Nickel. 4 hrs. Plate #1.
Resistance 5.02 Ω. Decreased a very little in magnetic field - less than .01 Ohm.

Nickel. 2 hrs. Plate #1.
Resistance 7.08 Ω. Decreased to 7.04 Ω in magnetic field on first trial but on two subsequent trials it remained at 7.08 Ω both in field and out.

7/5/07.

Platinum. $3\frac{3}{4}$ lin. Plate #1.
Resistance 4.54 ω. Unaffected
by magnetic flux.

Copper. 2 lin. Plate #1.
Resistance 23.98 ω. Unaffected
by magnetic flux.

Tungsten. 12 lin. Plate #1.
Resistance 446.5 ω. Unaffected
by magnetic flux.

Bismuth. 1 lin. Plate #1.
Resistance 406.0 ω. Unaffected
by magnetic flux.

Iron. 12 lin. 12.06 ω.
Silver $\frac{3}{4}$ " 2.06 ω.
Conductivity of both is
unaffected by magnetic
flux.

July 10, 1907.

Resistance Measurement.

Silver Films – Plotted for different lengths of time after first sparking tube for about an hour to combine all traces of oxygen. Purified hydrogen was in tube as usual.

Contact pressure on each coil will be 2450 grams.

Silver. 5 mins. Exp. = 33.

One side	9.27	ω	20.76
Other "	37.76	ω	

Silver. 4 mins. Exp. = 39.

One side	44.48	ω	180.14
Other side	315.8	ω	

Silver 3 mins Exp. = 40.

One side	38.51	ω	532.75
Other "	1077	ω	

By transmitted light the 5, 4 and 3 minute Silver films are blue, the 2 and 1 minute films are blue and yellow, and the ½ min films are mostly yellow. The yellow color varies from a pinkish yellow to straw color.

By reflected light the colors are just reversed i.e. the blue films look straw color and the yellow films look blue.

Silver 2 min. #34.
Both sides over 1.000.000 Ω.

Silver 1 min. #35.
Both sides over 1.000.000 Ω.

Silver ½ min #36.
Both sides over 1.000.000 Ω.

Silver ½ min #37.
Both sides over 1.000.000 Ω.

Silver ½ min #38.
Both sides over 1.000.000 Ω.

July 15, 1907.

Effect of Temperature on Resistance.

The plate carrying the metal film is laid on a small piece of plate glass, and brass contact clamps are adjusted and fastened so that there is an inch of the film between the contact edges. The whole thing is then immersed in a bath of paraffin oil for the measurements.

The temperature of the bath will be maintained at each point five minutes before taking the measurement of resistance.

Platinum, $3\frac{3}{4}$ ins. Plate #3.

Measured resistance in air at 24° C. - which was 4.08 ω. Then immersed in oil at same temp. and measured again. It then was 4.07 ω - showing that the oil is a good insulator.

7/15/07.

Platinum. 3¾ hrs. cont'd.

Resistance at different temperatures was found to be as follows –

TEMP. °C.	RESISTANCE.
25°	4.06 Ω
41	4.19
60	4.20
90	4.31
100	4.37
120	4.43
Oil-bath was jarred slightly here.	
140	4.42
160	4.46
180	4.36
200	4.19

Sydney 16, 1907. Wheatstone platinum .3 ohm

Oil-bath containing film and contact pieces, was left to cool off last night. The connections were not disturbed.

Will now repeat yesterday's test and also take measurements going back down from 200° to normal –

TEMP. °C.	RESISTANCE
23°	3.66 4
40	3.74
60	3.80
80	3.87
100	3.91
120	3.98
140	4.04
160	4.10
180	4.17
200	4.22
180	4.13
160	4.05
140	3.98
120	3.91

Temp.-Resistance Curve, cont'd.

TEMP. °C.	RESISTANCE.
100°	3.86 Ω
90	3.80
60	3.74
50	3.715
40	3.69
27	3.665

Increase in resistance for 160° rise in temperature (40° - 200°) is 4.22 - 3.74 = .48 Ω or 12.8 %.

The temperature coefficient of platinum according to these figures would therefore be .0008 per degree C. This is much lower than the value usually given. Dewar & Fleming give .00367 for Platinum and Mathiessen gives .00247.

July 17.1907.

Temperature - Resistance Curve

Platinum - $3\frac{3}{4}$ lbs.
Same film that was used yester-day and the day before.
Connections have not been dis-turbed.

TEMP. °C.	RESISTANCE.
23.5°	3.66 ω
40	3.74
60	3.84
80	3.89
100	3.96
120	4.02
140	4.09
160	4.13
180	4.17
x 200	4.21
180	4.13
160	4.05
140	3.99
120	3.94
100	3.88

Temp.-Resistance Curve, cont'd.

TEMP °C.	RESISTANCE
80°	3.92 Ω
60	3.76
40	3.69

Very humid day. — Moisture may cause errors in readings.

These films are not plated evenly on the glass. On most of them the metal is deposited the most heavily near one edge and thins down gradually toward the other edge.

By transmitted light the thicker parts of all the films are green, which becomes a yellowish green as the film thins down and finally pale blue in the very thin parts. The "thin plate" of the 1 and 3 minute films are nearly all blue.

By reflected light, films look salmon-pink shading into purple in the thin parts, from the front; and old gold color, having a burnt appearance in the thin parts when viewed from the glass at the back.

7/17/07.

Resistance Measurement.

Contact Pressure 2450 grams.

Gold. 5 min. Plating.

Exp. #42

Thick Plate	11.94 Ω
Thin "	18.50 "

Gold. 4 min. Exp. #43.

Thick Plate	16.68
Thin "	68.85

Gold 3 min. Exp. #44.

Thick Plate	145.1
Thin "	305000

Gold 2 mins Exp. #45.

Thick Plate	22.30
Thin "	127.6

Gold 1 min Exp. #46.

Thick Plate	19.07
Thin "	over 1,000,000

July 15, 1907.

Temperature-Resistance Curve.

Platinum - 3 3/4 hrs.

Same film that has been used before for this test.

Temperature will now be kept at each point 15 minutes before taking the resistance measurement, instead of 5 minutes as formerly.

TEMP. °C.	RESISTANCE.
25°	3.655 ω.
40	3.76
60	3.84
80	3.90
100	3.97
120	4.05
140	4.11
160	4.17 ← Both panel lamp holders connected thermometer
180	4.19 full current contact plates.
x 200	4.22
180	4.07
160	4.04

7/18/07.

Temp.-Resistance Curve, cont'd

TEMP. °C.	RESISTANCE
140°	3.98 Ω
120	3.93
100	3.89
80	3.84
—	—
25	3.70

These films were tested before for resistance on July 17th which was a very sticky hot day. The air is dry to-day and the resistance of all but one film is higher.

Glass is hygroscopic and the metals may be, so that the humidity of the atmosphere possibly affects the results.

July 19, 1907.

Resistance Measurements.

Contact Pressure: 2450 grams.

Gold. 5 min. Exp. #42.
Thick Plate 113.88 ω
Thin " 27.62

Gold. 4 min. Exp. #43.
Thick Plate 17.71
Thin " 79.98

Gold. 3 min. Exp. #44.
Thick Plate 618.0
Thin " Over 1,000,000

Gold. 2 min. Exp. #45.
Thick Plate 60.45
Thin " 79.17

Gold. 1 min. Exp. #46.
Thick Plate 9.47
Thin " Over 1,000,000

Thick plate is opaque in parts.
Thin plate is translucent. Deep bluish green by transmitted light. Pure gold color from either side by reflected light.

Transparent.
Coatings are not as heavy as the 12 hr. platings of Fe (#72) done in the old way without sparking free of oxygen.
By transmitted light color is gray with small yellow spots here and there and numerous pinholes.
By reflected light thin film is gray and thick film is brownish gray. Both have white markings extending up from the lower corners.

7/19/07.

Resistance Measurements, cont'd.

Gold. Exp. #47.
30 minutes plating after sparking tube one hour.

Thick Plate	1.48	Ω
Thin "	1.81	

Iron. Exp. #41.
15 hrs. plate after sparking tube one hour.

Thick Plate	725.6	Ω
Thin "	554.0	"

Put thick Fe plate in the brass clamp to try effect of magnetism.
Resistance in clamp 511.1 Ω.
Resistance unaffected by magnetic lines passing thru film in any of the three directions.

The 3 minute films look to be nearly the same thickness.

July 25, 1907.

Resistance Measurements.

Contact Pressure 2450 grams.
Tube exposed free of O before starting the plating.

Platinum. 5 min. Exp. #48.
Thick Plate 71.53 ω
Thin " 235.00

Platinum. 4 min. Exp. #49.
Thick Plate 761.4 ω
Thin " 1811.0

Platinum. 3 min. Exp. #50.
Thick Plate 107.1 ω
Thin " 350.2

Platinum. 2 min. Exp. #51.
Thick Plate 3599.0 ω
Thin " 51950.0

Platinum. 1 min. Exp. #52.
Thick Plate Over 1,000,000
Thin " " "

See note on next page over.

July 26, 1907.

Temperature-Resistance Curve.

Same apparatus that was used in making this test on the $3\frac{3}{4}$ in. Platinum film. (See under July 15.)
Temperature kept at each point 5 minutes before taking the resistance reading.

Gold. 30 min. Thick Plate. Exp. 47.

TEMP. °C.	RESISTANCE
25.8°	.827
40	.852
60	.88
80	.91
100	.942
120	.96
140	1.00
160	.96
180	1.05
x 200	Over 1000000
180	" 1 "

On taking film plate out of contact clamps, found that the gold was completely removed at each end where the tinfoil made contact with it – this being the cause of the enormous rise in resistance.

No gold can be seen on the surface of the tinfoil, but it appears to have alloyed with the foil.

TEMP. °C.	RESISTANCE
140°	Over 1.000000
140	" "
120	" "
100	" "
80	" "
60	" "
40	" "
21.5	" "

Increase in resistance for 100° rise in temperature (40° – 140°) is .15 or 17.6 %.

This would make the temperature coefficient of gold .0176 per degree Centigrade.

Matthiessen gives it as .00365 per degree Centigrade.

July 29, 1907.

Temperature - Resistance Curve.

Temperature kept at each point five minutes before taking the reading.

Silver. 45 min. Exp. #28. Plate #1.

TEMP. °C.	RESISTANCE.
22.2°	1.594 Ω
40	1.61
60	1.632
80	1.66
100	1.72
120	1.84
140	1.97
160	2.05
180	2.75
x 200	3.71
180	4.47
160	5.14
140	6.04
120	6.18
23	6.14

Took plate out of contact clamps after this test and found that oil had gotten in between the silver and the foil.

The exposed part of the film between the contacts has changed color. It is now yellowish brown by transmitted light. By reflected light it looks white from the front side and blue from the back side. There is a sharp black line on the front of film where the edge of the foil came.

The ends of the film which were under the clamps have not changed color, i.e. - they are blue by transmitted light and white by reflected light.

July 30, 1907.

Temperature-Resistance Curve.

Temperature kept at each point five minutes.

Platinum 3¾ hrs.
Exp. #7. Plate #1.

TEMP. °C.	RESISTANCE.
24°	4.94 ω
40	4.96
60	5.05
80	5.17
100	5.36
120	5.51
140	5.75
160	5.62
180	5.24
x 200	5.28
160	5.10
100	4.95
60	4.70
33	4.60
22.2	4.56

Increase in resistance for 100° rise in temperature (40° - 140°) is .423 Ω or 9.14 %.

Temperature Coefficient would therefore be .000914 per degree C. - corresponding pretty closely to the value found on the first Platinum film on July 16th, which was .0008 per degree C.

These values are only about one third of the value usually given for Platinum wire.

July 31, 1907.

Temperature-Resistance Curve.

Platinum 37 hrs. Exp. #7. Plate #1.

Test repeated same as yesterday. Connections have not been disturbed.

TEMP. °C.	RESISTANCE.
25.3°	4.59 Ω
40	4.627
60	4.703
80	4.79
100	4.876
120	4.96
140	5.05
140	5.12
130	5.16
x 200	5.20
180	5.11
160	→ Not Constant
140	5.04
120	4.94
100	4.88
80	4.80
61	4.73
32	4.595

Resistance Data on Some of the Metals From Mattiessen and Others.

Ohms per Mil-Foot at 0°C.

Aluminum	17.4
Antimony	211
Bismuth	730
Cadmium	6.0
Cobalt	
Copper	9.5
Gold	12.3
Iron	54.5
Lead	117
Magnesium	26.2
Mercury	566
Nickel	74.4
Palladium	61.1
Platinum	54
Silver	8.94
Thallium	106
Tin	78.5
Titanium	
Tungsten	
Zinc	34.8

Notebook, N-07-06-18

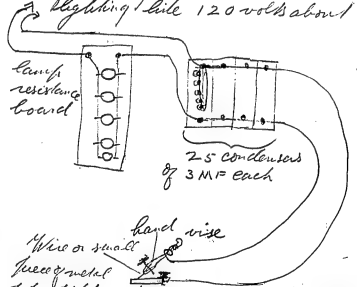
Experiments on the scintillations of the different metals under the electric spark.

June 18. 1907

A. McGlaister

To cause the scintillations use the following apparatus

Lighting line 120 volts about

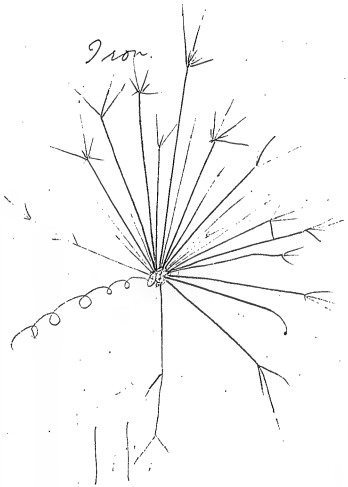


Used 1 16 candle power lamp on the board & 25 condensers of 3 MF each making 75 MF in all

x When I threw the arc light on the terminals I could see a trace of smoke but much less than with Cu or Mn.
The scintillations show no elevation with a strong magnet

Iron

used a piece of clean sheet iron & a piece of fine iron wire. With this metal the blue spark round the terminals is comparatively small
The scintillations are long almost all straight till near the end where they fork ~~and~~ the stronger portion is a bright white or slightly yellow colour the side branches that fork off are red & gradually become dull red they are generally straight & in some cases show dark spaces, some of the scintillations do not show forks & in this case they almost always show a dark space near the tip.
When the surface of the metal is clean the scintillations are less in number & shorter than where there is a slight film of oxide and with the clean metal the terminals show a great tendency to weld. there is absolutely no smoke with these scintillations X



with clean surfaces the scintillations would average two or three inches but where there was a film of oxide they would be thrown out as far as 12 inches or more
Now & then an exceptionally large scintillation would end in a little bead of metal
~~In no case did I find any scintillations that started from more than one point~~, the end of the main scintillation was just as thick & bright as the beginning but it did not show any tendency to beading ~~but it was not a bad steel but did not find any appreciable difference~~
~~although~~ the speech from iron on an emery wheel & found it to have the same general character the only difference being that most of the sparks were brighter at the end than at the beginning in some cases they were brighter after the fork than before.
Now & then iron throws off a spiral but it is only very seldom, the spiral is much coarser & more decided than that

Chromium.

In hydrogen could not be distinguished from iron shows striations but colourless dark spaces

The scintillations show no deviation with strong magnet

Chromium.
Used pure fused chromium.
The scintillations from this metal bear some resemblance to those from iron but there are some marked features of difference.
The scintillations begin straight as with iron and at a certain point they branch out forming more branches than with iron. The end of the straight part is generally thickened or even ~~beaded~~ beaded
The main branches at the point of forking show ~~a~~ a tendency to bend the first stretch line at a higher angle than in the case of iron
This metal gives a slight amount of smoke in thin curling lines. These are light up from the blue light of the spark & look almost like a brush discharge
I could never observe this effect on the first discharge so it was probably the spark igniting the smoke from a previous discharge

Occasionally a very large spark would show signs of rebranching on one of the large branches. Few of the biggest sparks did not seem connected with the blue arc but would be thrown out say half an inch before they would show as a white line.

Most of the fine branches showed sharp dark spaces at the tip then a brighter piece then before the a little wedge.

In colour & intensity the arc cannot be distinguished from the the principal difference is in the formation of a bead at the point where the main line branches & in the larger number & more obtuse angles of the branches. The clean terminals of chromium show some tendency to weld but not as much as those of iron.

Manganese

In hydrogen no trace of revolution visible the ~~[illegible]~~ forks no black spaces dull red could not be distinguished from earth on

the scintillations show no deviation with a strong magnet.

Manganese

The scintillations from this metal are like those of iron in colour & intensity but they differ in that they are almost all curved & twisted & the particles thrown off seem to be larger & can be seen to be revolving there is considerable smoke which forms long spiral lines owing to the revolving particles most of the scintillations are forked but not nearly so much so as chromium, owing to the crumbly nature of the metal the spark loosens little fragments which are scattered all round most of the bigger scintillations do not show luminous till a little way from the ~~[illegible]~~ metal luminous tenacious gunbladed particles are thrown off which show up as a revolving ball of fire & remain luminous till they strike the desk the scintillations that fork are twisted like those of chromium but they do not form as many branches

Many of the scintillations go almost

straight & appear very faint then they take a sudden bend & become much brighter

There are quite a number of the smaller ones which do not branch but end off with a slight bend then a dark space & a light red tip.

Some may be seen at first as a thin straight line then they get thicker & show signs of revolving.

The number of curved streamlets & the appearance of revolving particles at once distinguishes manganese from either iron or chromium

The terminals such iron do not weld but on the other hand they crumble away.

The difference between the streamlets of this metal in air & in hydrogen is most striking in the latter there is no hint of the appearance of revolving no branches & the light is very dull red no dark spaces visible the hydrogen does not prevent the smoke formation

Aluminium (al)

This metal shows two distinct kinds of scintillations

I large lightning blue lines which begin straight then suddenly twist back on themselves & range to this curved & twisted lines of dull red

II small scintillations which are thrown out as red lines from the first and are very dull in colour compared to the others.

The larger scintillations show great variety in the way they finish. The greater number twist upon themselves & become red & very crooked but remain as a single line without forking. Others show two or three distinct branches of the ground of which the blue turns out red while here & there one may be seen to throw off branches while it is still coloured blue.

Most of the large blue scintillations show signs of zeroloing.

This metal shows some smoke but very little hardly enough to be noticeable without the arc off.

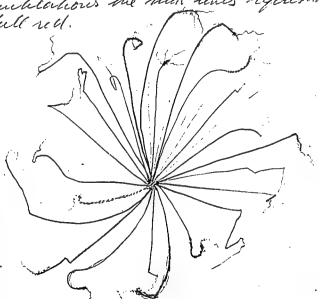
Aluminium in by Drager

all charges have no branches
dull - ish no trace of the
blue scintillations which are shown
no dark spaces visible

Al3

In some cases the beaded appearance
due to revolution shows only in the
small red spots but does not show
in the blue line at all
Sometimes with the more prominent
scintillations the spot where
the blue changes to red seems to
be surrounded with a red light like
a gas flame.
When the al is used as terminals
in the black discs for photography
the Al_2O_3 formed seems to be
attracted by the static charge
in the discs & bridges across the
gap in fine threads
Most of the larger scintillations of
aluminium seem to be enveloped
with a sort of flame which gives
off so much light that it fills
up the blue tail at the end
of the scintillation
The spark at the point of contact
is large & bright blue in colour.

Aluminium
The thick lines represent the blue scintillations the thin lines represent dull red.



The shading on some of the large scintillations is meant to represent an envelope of flame which encloses a good deal of the fine details at the tip of the scintillations

(82)

~~without the arc lighted~~
The terminals have considerable tendency to ~~stick~~ weld when they are clean.
When the terminals used are clean there is not much blue spark and there are comparatively few of the red scintillations when the terminals are dirty there is a large blue spark & a great many dull red scintillations with just a few blue but these blue ones are very large & brilliant
The greater part of the large blue scintillations are starting at first as many turn red at the point before they commence to burst while others burst while still blue then fade into red
Many show some spots after they turn red a few show quite an explosive head like Cl.
Some of the scintillations have a beautiful appearance the whole length of the blue due to revolving others show continuous all near the end then show the revolving just at the termination

Magnesium

In hydrogen
Gives very few scintillations but when fed in gas are quite straight & dull red there is chestnut smoke formation

What scintillations there are are very short

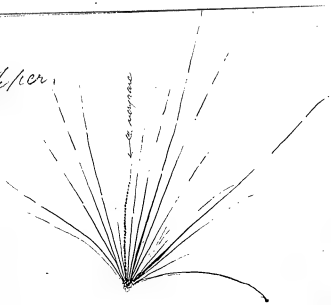
Magnesium.

The scintillations of this metal are very similar to those of aluminium the principal features of difference being that they show much more of the beaded spiral appearance due to revolving and they have very little tendency to curve & twist like aluminium the principal scintillation is blue & at the end changes to red but both the blue & the red portions show revolving.
Like Al. most of the large scintillations show an envelope of flame which tends to hide the fine detail
Also like Al the omega formed when the two terminals are between the black discs, is altered by the static charge & forms thicker arms the g.o.f.
The spark of the positive contact of the terminals is bluish green in colour even with clear metal the terminals show very little tendency to weld when held between the brass springs

they may be pressed together & will give a small arc for some time without any tendency to stick the big scintillations show much more tendency to fork than those of Al some seem to come to an explosive head like Cr.
If a number of sparks were made in quick succession among the smoke could be seen little silvery particles of metal ~~[illegible]~~ light up from the flash of the following spark.
Magnesium seems to crumble under the spark but nothing like the same extent as Mn there are small fragments all scattered over the bench but they are much smaller than those from Mn this metal seems to show even greater variety than aluminium some of the scintillations are very much twisted & others are straight & thick some show much forking & even an explosive head while others do not fork at all but all even the finest red ones show some signs of spiral revolution.

The photographs showed quite frequently a marking that started which then came to a shoulder & continued thinner having an appearance like the marking on a phonograph record.

Copper.



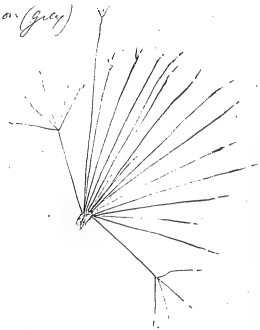
In Cryolite showed almost the same. The colour a darker red. Sometimes the spark was surrounded with a scarlet envelope as and initial but saw this in air also so it is not connected with the cryolite

Copper.

The scintillations of this metal are quite different to any of the previous ones.
The spark at the point of contact is small and bluish green in colour
The scintillations are a dark red colour & very long at times, when the spark is made between two points they may flyout two feet, the scintillations are all straight & are only very slightly curved like a spearbalood and they throw no forks they start thick and gradually become thinner & finally are quite fine then there is a very distinct dark space sometimes ½ an inch long then the light begins again & might be quite thick at the base & thinnest down again to from another dark space & a second or even a third bright tip

The Mean terminals show
some tendency to weld but
not as much as Fe
There is some smoke formed
but not enough to be very
noticeable except in a very
O are light the smoke does not appear
The ~~such~~ scintillations are
thrown off in a more distinctly
radial direction than such
some of the other metals there
is very little tendency for them
to cross one another's paths
Transversally there is a striation
which shows a twisted appearance
throughout its whole length
but these are comparatively rare
Tried several photographs but
could not get anything that
showed the characteristics as
the copper scintillations are
such a dark red colour
Copper in oxygen is just the
same as in air ~~except~~ except
that it is a more blue brighter
but in shape & character it
is just the same

Cast Iron (grey)



In hydrogen

Very distinct well marked spaces visible. no branching visible

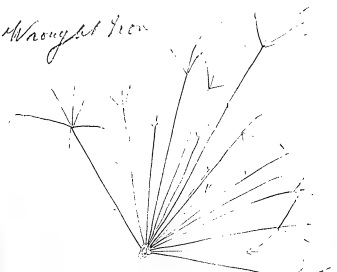
Further work on Iron

Did some further work on Fe to see the difference between cast & wrought iron & different forms of steel. Also tried to deflect the striations of Fe with a powerful electro magnet but found it had absolutely no effect.

There is a distinct difference between cast iron, wrought iron & tool steel but could not notice any appreciable difference between wrought iron & machine steel & grey cast iron

The noticable feature about cast iron is the very small individuality of striations. They look [illegible] the striations & then a little at the end & then have a dark space & a very small dark on the [illegible]

Wrought Iron



In Hydrogen.

Dull red no something visible but dark spaces very noticeable

where there is a forked one the forks are usually very large & spread out very widely at the bottom of the point

Wrought Iron
this differs from cast iron in the greater number of sandbloows which show forks

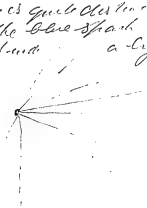
Machine steel.
I could not notice any difference between machine steel & wrought iron.

Tool Steel (rod)
the difference between wrought iron & untempered tool steel were only very slight as the forks of the secondations were slightly more inclined to be feathery

Steel from file
this was more distinctly feathery at the end of the sandblows than the piece of rod tool steel.

Steel from file

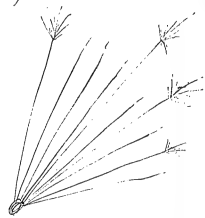
In hydrogen no branches visible
dark spaces quite distinct
sometimes the blue spark is
surrounded with a light red
inner light



each scintillation had more
small branches at the end
than was the case with
wrought iron

Effect of tempering
Broke a file into 6 pieces
heated two red hot & plunged
into water = glass hardened
heated two more pieces &
allowed to cool slowly = drawn
left the other two just as they
were.
cleaned up the surfaces on
an emery wheel & tried the
difference in the scintillations
but could not detect any
difference in the character
the two pieces that were drawn
showed the most tendency
to ~~[illegible]~~ weld and the
scintillations were not quite
as long as with the others.
the scintillations from the file
steel are much more like
those of wrought iron

Self hardening steel



Self hardening steel

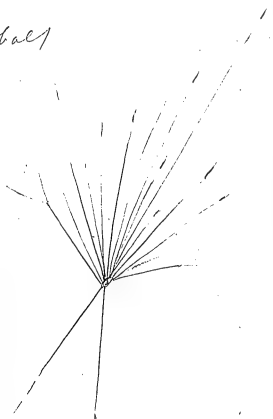
The trunk & branches of this are of two tunels some without any forks like the dendritic ones in cast iron & others that have many branches & are feathery like the fern

Effect of an atmosphere of hydrogen.

I fitted a wooden box made with 2 glass sides & put the discs containing the metal terminals in this & passed dry hydrogen in at the top & out at the bottom into an inverted test tube to prevent diffusion inside the spark by means of a stick going through the box & connected with only the springs carrying the disc. I found that the hydrogen made an enormous difference that I thought at first instead of being bright yellow the sparks were only a dull red & showed absolutely no forks but were only short lines with a number of dark spaces looking like a discharge of small condenser through

cover.

Cobalt



In hydrogen looked just like copper but in air showed no trace of dark spark phenomenon but red

Cobalt

The scintillations of cobalt bear considerable resemblance to those of cast iron but in the case of cobalt there are even fewer forked scintillations. The most characteristic scintillation shown was one strongest scintillation which gradually became thinner till there was a very short dark space & a dash added on at the top that was as thick or thicker than the first part of the scintillation. Then there were others which showed several ~~scintillations~~ dark spaces. The little flashes that were not as thick the scintillations of this class were almost exactly like those of copper except for a difference in colour they were not quite so dark a red. Then again there were some scintillations which showed forks but the forks were different from those of iron the branches

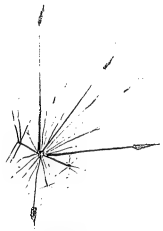
did not as a rule fly out at such a wide angle as the forks were usually as thick as the straight bar they came from but were not as bright in colour these branchlike scintillations were comparatively rare

There was very little smoke unlike the cobalt shark less if anything than usual iron

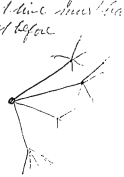
some of the scintillations showed a very slight signs of revolving the spindle was very close I needed much looking for to observe it at all.

Cobalt shows the showers! Nickel to weld of any metal need fat. between clean terminals the spark makes them stick so that it is quite difficult to pull them apart

Iron in Oxygen (Wrought Iron)



While steel in oxygen x
x Steel thin again but found [illegible] on branches next time [illegible] been some can test before

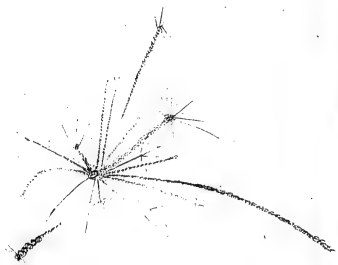


The forked scintillations were longer than each separation

Iron in Oxygen. (Wrought Iron)

In oxygen the characteristics of the scintillations of wrought iron are altogether altered they are brighter but shorter & show very much less tendency to fork on the other hand most of them end with a little dark thicker & brighter than the rest of the scintillation & this dark oxide has jagged edges looking like the beards & savages & the short scintillations which do fork much are generally very short & bright with each slightly explosive with a bend like chromium in air.
The scintillations lipped with the ragged dark are generally very thick. Some of the branches of the scintillations show a slight thickening towards being a spiral
There was slight evidence of smoke formation
Steel in oxygen (File steel) this showed more tendency to fork the forks were very bright there was not much evidence of the dagger ends like soft iron showed.

Mn in O.



Distinguished from Cr.

Chromium in Oxygen

The character of the scintillations is not much altered by oxygen they show brighter perhaps a rather larger proportion do not fork but the greater number show an explosive head & fork just as they do in air.

Manganese in Oxygen.

The oxygen makes a wonderful difference in the scintillations of Mn. they are very bright and thick and though still sparks do not show as much tendency to irregular bursting as in air and at the tip they have a regular fan of fine branches some of these thick scintillations show no connection with the terminals at all but begin thin & gradually get thicker till they burst! The main scintillation is a mere white & the star of branches a fairly bright red while some of the scintillations show the red very well others look quite straight & could not be

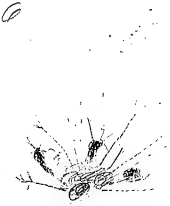
Al in 6

below a very bright blue and red
fringe at the tips.

Aluminium in 6.

This metal burns so quickly in 6 that most of the scintillations are much shorter than in air they are all much brighter & of a more clouded blue colour. There is very little tendency to double back on themselves & form knots as in air on the other hand many of the large scintillations seem to explode & branch at the point as they hardly ever do in air. The tendency to form spirals is more marked than in air. There are practically no red scintillations all are blue but the tips & branches are still red. These scintillations in 6 look more like Mg in air. Quite a number of the scintillations end off without any change simply in blunt end to the straight blue scintillation. The spiral tendency & formation of explosive point are neither as marked as with Mg but are much more noticeable than with Al in air

Mg in O



Magnesium in O.

It is difficult to get any large scintillations of Mg in O it burns so rapidly that one only gets a brilliant flame round the terminals this flame illuminates the smoke so strongly that it shows up in the photographs but sometimes very large scintillations can be obtained as a sort of irregular continuation of the wood flame round the terminals, and occasionally there would be then scintillations showing the characteristic spinal assem in air but they would all be thought not tested all ways as in air sometimes there would be a thin bright line with three or four thicker slighter patches in the beads. Still one might often make 8 or 9 sparks before getting any scintillations at all

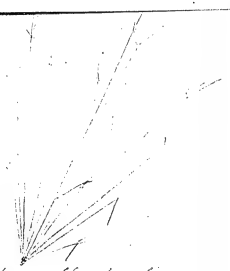
In Air & Oxygen

Mud Fe At & Mg in a mixture of about 2 parts air & 1 part O the Fe gave all the characteristics of Fe in O except that the scintillations were not quite so bright & a little longer

Al gave characteristics intermediate between those of air & Fe in O the scintillations were longer than in O & brighter than in O but they were in a good condition to photograph the ends of the scintillation in some cases fine bits of fuse in air & in other cases showed an explosive type as in O there was more tendency to form spirals than in air

Mg also gave characteristics intermediate between air & O the large irregular blue flame was there but was smaller than in O & there was a larger proportion of the typical thorsell spiral scintillations

He in bb.



bottom a dull yellowish red. characteristics almost the same as in air.

He in bbiorine

Filled ~~with~~ the sparking box with dry bb (generated from bbH & KMnO4 the gas must be dry or it very soon blackens the glass) & made the scintillations of He in this gas the scintillations were both very numerous & very long and it was much easier to get a big spark than in air. They were not quite so bright as in air & the colour of the bb end of some actinic light but lack in definitely in getting photographs like characteristics the footbeg was just the same as in air & the photographs could not be distinguished from those made in air the principal difference lay in the clouds of smoke that each spark made after 5 or 6 sparks the glass began to get obscured too much to photograph more

Chromium in chlorine

Not the longer than in air colour dull yellowish red

Chromium in Chlorine.

The scintillations of chromium in chlorine are very numerous & long as is the case with iron in fact you can get a big shower of sparks in chlorine every time while in air sometimes the scintillations are almost absent. The chlorine scintillations are dull red & longer on the whole than in air but the general characteristics are the same as in air the top of the scintillation ends in an explosion and throws out branches exactly as it does in air, the scintillations were too dull to get good photos as with iron so much chromium in chlorine dense clouds of smoke are given off from the sparks

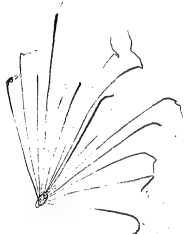
Mn in chlorine

below & general characteristics very schematic of chromium in Cl

Manganese in chlorine.

The scintillations of manganese in chlorine are quite different in character from those in Cr they more nearly resemble chromium. In colour & brightness they are almost the same as iron & chromium in chlorine and they seem to have lost most their tendency to twist & form spirals the larger scintillations have slight curves but the sharp twists that are found in Cr are almost entirely absent the scintillations pound brighter the further away they get from the spark ~~the~~ [illegible] number of atoms show no attachment to the central spark at all after careful looking could not see any spirals at all some of the scintillations have a slightly wavy outline but a large proportion of them are quite straight it would be difficult to distinguish with certainty between this metal & Cr in Cl,

Al in Al



Lines red rather brighter than the in air shape about the same as Al in air.

Aluminium in chlorine.

On making the scintillations of Al in chlorine one sees at once the great difference that results from its being intensely bright ~~red~~ blue as in air they are ~~bright~~ red in colour. The type & shape they are about the same as in air.

The scintillations make some impression but not nearly as much as Fe or Cu.

As in air there are no branches visible or at any rate only very minute ones.

Could not detect any indication of spiral formation.

Dry in bl

Flame very slightly blue very bright blue round the terminals which illuminates the large smoke with a blue light

Magnesium in chlorine

The effect of chlorine on the scintillations is most curious the scintillations in the form of continuous twisted line as seen in air are very rare & the mean number seem to have the black spaces in the scintillation so enlarged by the chlorine that they are large black as a line but as one or in some cases two or three luminous dots. these dots are slightly blue in colour but not nearly so blue or so bright as in air there is a bright blue spark at the terminals & a very dense cloud of smoke formed and among this smoke are seen hard white bright dots or blue light the flame blue & spark round the terminals instead of round the one formed in O the few but scintillations that are formed are similar to those in air.

Vanadium

Some of the scintillations have hardly any tail at all just an explosive burst

Vanadium

This element used in the form of a fine powder as we had no more vanadium in pieces the form we was spread over a sheet of gauze & the spark obtained by using a strip of gauze as the other terminal gauze was chosen because it gives practically no spark

The scintillations from this element are very similar to those of chromium the colour is of something a little bigger and they show no tendency to enter plasma fire ball like lead. Quite a large number of the scintillations show no connection with the point of contact on the gauze plate they may travel for about 2" before they become visible then they begin as a fine dull red line consisting of sparkling & getting brighter till they burst there seemed to be no appreciable smoke, I never was near able to observe a dark space followed by a light dash as seen in cr. & Fe

[THIS BOOK WAS USED IN BOTH DIRECTIONS. THE FOLLOWING PAGES WERE FILMED FROM THE BACK END FORWARD.]

Methods used to photograph the scintillations.

Tried first with the no/ Kodak 1 discharge about 2 feet from lens at F 11 very little pucked up at this stop

Tried again at full opening & about 18" away this showed much more exposure but very little depth of focus being so near at that large stop

Found the best way to focus was to use a candle flame just in front of the Fe plate & focus from ½" to 3/4" forward the distance which gave about the best compromise was about 20" – 23"

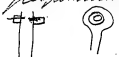
Took Fe, Cu & Mn, under these conditions.

Took Fe & then Al with the reflex at 1/500 & a set very little showed with Fe but with the Al got some traings about 1" long

Speed of fan motor
no load on

I switch on resistance about 1800
II — 2200
III 3100

7" in use some brass shields on springs to cut out the spark & most of the scintillations going much out of perpendicular the diam of



the discs was $\frac{3}{4}$" & at the time of spark they were about $\frac{1}{8}$" apart used the front bellows of the camera fully extended & focused by moving the whole camera the distance from the terminals to the front lens was about 16" this gave a picture about natural size

later on got new 4x5 camera & 7" Zeiss brass set this at the position to give a picture just natural size

later on had to try the scintillations in different gases for this enclosed the discs in a box with glass windows with gas inlet & outlet tubes & a shed arranged to touch the terminals together

Method of making Plates
pol Sensitive
By Andrew Payne
Photo Era

Bathe the plates for 3
minutes in a solution of
Pinacyanol 1 in 1000 alcohol) 2 cc
Distilled H2O 100 cc
This should not be used
more than once
Wash the plates for 3 minutes
wipe with pads of cotton &
dry.

Green safe light for use
with above plates
The following solution used
in a cell 1" thick.

Acid green	2 parts	Aqueous
Naphthol green	1 parts	25 parts
Gelatin	15 parts	of H2O
Distilled water	306 parts	

Use a sheet of ground
glass on front of the cell.

Pinacyanol (1 in 1000 alcohol) 2 cc
Dist. water 100 cc

Do not use more than once.

Green Safe Light

Acid green	2 parts
Naphthol green	2 parts
Naphagin	15 parts
Distd. dist.	300 parts

Dilute this 1 in 50 solution with 25 parts of H2O and use in a Wratten 1" filter.

In case of necessity the plates do not need to be dried and may be loaded into the plate holder after being wiped off with cotton after exposure. They should be soaked about 10 minutes in dist. water to make evenly wet before development.

Even with the ~~red~~ safe light mentioned do not expose the plates to light more than is absolutely necessary.

Notebook, N-07-08-12

07-08-12

Sabr = 1953.

"Edison Effect."

Definition.

Phenomenon of flow of current observed in an ordinary incandescent lamp when a third electrode, which has been sealed in the lamp, is connected to the positive leading-in wire of lamp.

In the following experiments the effect will be observed by means of a D'Arsonval galvanometer reflecting a beam of light onto a straight scale at a distance of 53 inches.

August 13, 1907.

Samp #1.

Samp is marked for 116 V.
At this voltage it takes
570 milamperes and there-
fore consumes .570 x 116 = 66 Watts
Assuming an efficiency of
3.4 watts per C.P. the lamp
is found to have approximately
19 Candle-Power.
Filament makes only one
loop and a platinum wire
is sealed in between the
filament terminals. This
third electrode extends into
the vacuum about 1½ inches.
Took off readings with gal.
connected between Pt and positive

82.9	V. at Samp.	369	Amps.	2 mm.	Dif.
89.3	"	.409	"	7	"
93.7	"	.431	"	15	"
95.1	"	.443	"	21	"
100.7	"	.494	"	48	"
103.1	"	.492	"	76	"
109.6	"	.532	"	100	"
112.3	"	.550	"	122	"

I notice that the current from the vacuum, from the third electrode to the negative, does not appear immediately upon closing the lamp circuit but comes about one second later. This is not due to inertia in the galvanometer as this instrument will respond immediately to the slightest impulse.

August 14, 1907.

Samp. #1.
Carbon Filament 116V.
Galv. between third electrode and positive.
$\frac{1}{9}$ and $\frac{1}{77}$ Galv. shunt coils in ||.

Volts.	Amps.	Mm. Def.	
84.7	.398	15	Test #2.
95.1	.440	7	
101.9	.481	18.5	
107.5	.516	41	
110.5	.535	59	
117	.579	121	
120.5	.600	157	
128	.650	312	
131.2	.670	367	
142.7	.742	620	

Galv. between third electrode and negative, and shunted as before —

142.7	.742	10	

8/14/07.

Samp #1.
Carbon Filament. 116 V.
A 150 volt Weston Voltmeter used as Gal. - Connected between tend electrode and positive.

Volts.	Amps.	Def.	
97.2	472	.1	Test #3.
117.5	549	1.1	
126.2	639	4	
140	728	5.9	
132.7	677	6	
146.2	770	10.3	

Samp was allowed to cool off and test was then repeated -

96.8	452	.1	Test #4.
117.2	550	.9	
119.7	593	1.8	
122.2	613	2.2	
131.7	672	4.8	
132.9	690	5.9	
145	767	9.3	
148	785	10	

(See Over)

August 15, 1907.

Lamp # 1.

Carbon Filament 116 V.

Observations made with a Weston 150 V. Voltmeter, connected between third electrode and positive.

This is a repetition of last night's tests on the same lamp.

Volts	Amps.	Dev.	
95.8	442	1.1	Test # 5
110	537	1.6	
119	589	1.6	
126.7	640	3.1	
130.6	664	4.3	
141.5	737	8.5	
148	780	9.9	

8/15/07.

Samp #1.
Carbon Filament. 110 V.
D'Arsonval Gal. between third electrode and positive.
Gal. shunted with the $\frac{1}{9}$ and $\frac{1}{99}$ coils in parallel.

Volts.	Amps.	MMDEF.	
87.6	395	1.5	Test #6.
95.1	440	5	
99.8	447	9	
103.3	491	1.6	
109	527	35	
113.2	553	57	
120	597	120	
123.4	620	155	
127	641	220	
131.8	674	315	
136	701	406	
138.3	719	447	
140	729	500	
145	760	585	
Gal between 3rd electrode and negative -			
146	770	70	

8/15/07.

Stamp #2.

Carbon Filament. 113½ V.

Takes .576 amps at rated voltage

113.5 x .576 = 65.39 watts.

Gal. between 3rd electrode and positive

½ and 1/99 almost corks in ||.

Volts	Amps.	Mm. Def.	
85.3	.397	1.5	Test #1.
91.5	.436	5	
97.8	.472	13	
103	.509	30	
111	.560	85	
114.1	.581	130	
122	.633	293	
126	.663	417	
134.7	.718	636	

Gal. between 3rd electrode and negative

134.7	.718	0	

8/15/07.

Samp #2.
Carbon Filament 113½ V.
Galvanometer between third electrode and positive.
$\frac{1}{9}$ and $\frac{1}{99}$ Gal. shunt coils in ||.
Repetition of Test #1.

Volts	Amps	MM Def.	
91.9	437	4	Test #2.
96.8	467	10	
100.4	491	18.	
103	508	26	
105	540	53	
117.2	569	90	
117.7	602	166	
119.3	618	203	
122.5	638	265	
130.7	693	482	
135	722	605	
Gal. between 3rd electrode + negative.			
135	722	3	

8/15/07.

Sample #2.
Carbon Filament. 113½ V.
150 V. Weston Voltmeter between
third electrode and positive.

Volts	Amps.	D.E.F.	
89.9	473	+	Test #3.
100	490	2	
105.8	543	8	
112.2	569	12	
116.3	617	3	
122.2	636	3.9	
131	697	7.2	
134	713	9.8	
136.7	732	10.1	
138.2	749	11	
145	793	13.2	

8/15/07.

Sample #2.
Carbon Filament. 113½ V.
150 V. Weston Voltmeter between
third electrode and positive.
Repetition of Test #3.

Volts.	Amps.	D.E.F.	
92.8	441	+	Test #4.
98.7	430	.1	
110.7	557	1.	
114.2	593	1.5	
119.8	619	3.	
124.3	650	4.2	
128.7	680	6.	
131.3	699	7.1	
134.6	719	8.9	
142.2	770	12.1	
145.2	795	12.8	

The amount of current which flows thru the vacuum is very small = 3 to 500 milliamperes. Either be substituted for the galvanometer, it will not be affected appreciably with the lamp burning at 150 volts. This means that the current is less than .001 amp.

J.A.F. says that he has got ten enough current in this way to operate an ordinary telegraph sounder.

I am of the opinion that this large flow of current was due to residual mercury vapor in the lamps, as they were exhausted in the old way by means of Sprengel's pumps.

The present lamps under test were not exhausted on mercury pumps.

August 14, 1907.

Sample #2.

Carbon Filament 113½ V.

Galvanometer between third electrode and positive

$\frac{1}{10}$ and $\frac{1}{100}$ shunt coils in 11.

Second Repetition of Test #1.

VOLTS.	AMPS.	MM. DEF.	
89.8	421	2	Test #5.
94	450	4	
101	497	14	
106.7	532	30	
110.3	557	50	
113.9	579	80	
119	617	141	
124.2	651	232	
133.2	711	470	
136	732	538	
142.7	780	610	
Gal. between 3rd electrode + negative			
142.7	780	18	

The third electrode in this lamp is not all platinum. It is platinum for a short distance at the base but consists mostly of a black substance resembling carbon filament which is cemented onto the platinum.

8/14/07.

Samp. #3.

Tungsten Filament

Samp is not marked but seems to be about the right brilliancy at 10 volts. It takes about 5.1 amperes at this P.D.

Galvanometer connected between third electrode and positive and is not shunted.

Current readings could not be taken accurately because meter was calibrated for 100 amp.

Volts.	Amps.	MM. Def.	
4.01	3	5	Test #1.
5.12	3.4	1	
6.14	4	5.5	
7.43	4.3	7.6	
8.09	4.6	45	
8.75	4.9	69	
9.27	5	85	
10.14	5.2	114	
11.2	5.6	148	
13.07	6.1	221	
13.62	6.3	240	
14.95	6.6	280	
"	"	0	- Gal. bd. 3rd + neg. electrode

The galvanometer has been moved, since the last test and when setting up again I changed the distance from the galvanometer mirror to the scale. Before it was 53 m. and now it is 48 m. The change was made so as to get a sharper image of the beam of light.

September 11, 1907.

Tungsten Filament, Sample #3.
Galvanometer connected between third electrode and positive and is not shunted.
Have no suitable meter for taking current readings.

Test #2.

Volts	MM. Def. = Amps. x 10^7	
6.30	5	1
6.88	10.5	20
7.61	27	52
8.30	44	85
9.00	62.5	121
9.70	79	152
10.4	95.5	184
11.1	112	216
12	133	257
13	161	311
13.95	197	380
15	249	480

Gal. between 3rd electrode and negative –

15	0.	

September 12, 1907.

Calibration of Galvanometer.

Resistance of Gal. = 252 Ω.
Shunted it with 1 Ω. and connected in series with a 500 milliampere meter.
Readings as follows –

.005	amps.	=	107	mm. def
.010	"	=	214	"
.015	"	=	315	"
.020	"	=	405	"
.025	"	=	516	"
.030	"	=	603	"

Deflection of Gal. is practically proportional to the current.
The average deflection taken from the above straight line curve is 107 mm. for .005 amps.
Therefore if Gal. is not shunted it will be deflected 107 mm. by .005 = .0000197 amps.
253
One millimeter of the scale will then represent .0000193 amps.

(over)

This "Electric Mfg. Co." shunt is the one used in all tests to date.

$\frac{1}{9}$ and $\frac{1}{99}$ coils in || = 7.4 w, Constant 4.408

$\frac{1}{9}$ and $\frac{1}{99}$ coils in || = 60.94 w, Constant 4.133

9/12/07.

When shunts are used with the galvanometer, this value must be multiplied by a constant found by the following formula:-

$$\frac{\text{Galv. R}}{\text{Shunt R}} + 1 = \text{Constant.}$$

The Resistance and Constants for the various shunts used here are as follows:-

Shunt marked "Electric Mfg. Co. Troy, N.Y."

Plug in $\frac{1}{9}$ = 88.7 w. Constant = 1.284

" " $\frac{1}{99}$ = 80.8 " " = 4.118

" " $\frac{1}{999}$ = 8.05 " " = 37.13

"Elliot Bros. London."

Plug in $\frac{1}{9}$ = 72.9 w. Constant = 1.345

" " $\frac{1}{99}$ = 66.5 " " = 4.989

" " $\frac{1}{999}$ = 6.55 " " = 39.47

"J. Carpenter Paris."

Plug in $\frac{1}{9}$ = 75.6 w.

" " $\frac{1}{99}$ = 7.33 "

September 13, 1907.

Sample #1. Carbon.
Gal. between 3rd and positive.
Shunted with 40.94 ω.

Volts	Amps.	MM. Def.	Amps. x 10⁴	Test #7.
94	.438	5	4	
100.7	.480	14	11	
106.9	.519	34	27	
111.7	.549	63	50	
115.8	.572	101	81	
121.9	.611	185	148	
125.1	.633	263	210	
128.2	.653	326	260	
132.2	.681	412	329	
134	.691	461	370	
136.9	.711	525	419	
139	.729	584	466	
142	.749	630	503	

Vacuum here was about 29.9 inches of mercury.

September 14, 1907.

Sample #1. Carbon.

After admitting air and then recheasting as high as possible on a mercury pump.

Gal. between 3rd electrode + positive

Test #9.

First tried lamp at 130 V. with different shunts on galvanometer to find which one was suitable.

At this P.D., with a 6.55 ω shunt, gal. was deflected 630 mm. This is equivalent to .00479 amps.

Then, after a few minutes tried lamp at 140 V. using a 3.61 ω shunt and deflection was only about 100 mm. which is equivalent to .00137 amps. The current was very unsteady and galvanometer kept oscillating rapidly.

Now tried with 6.55 ω shunt again, at 140 V. Deflection was about 150 mm. (=.00114 amps)

but at intervals of about two seconds, galvanometer would suddenly swing up off the scale momentarily and then drop back to 150 mm. These oscillations could also be observed in the milliammeter - it being in series with both the main current which was lighting the lamp and the shunted "Edison Effect" current - and when the galvanometer connection between the 3rd electrode and positive was broken they disappeared, showing that the vacuum current was the cause of the oscillations rather than variations in the voltage of the line.

On opening the circuit for a short time and then closing again the oscillations would some-

times disappear and after a while the deflection, at 1.40 V. across the lamp, became quite constant.

Galvanometer was then connected with a 36.47 ω shunt and the following readings taken:—

Volts.	Amps.	MM Def.	= Amps. x 10⁶
100.2	.472	11	17
108	.520	32	49
114	.559	75	114
120.5	.601	156	237
125	.630	228	346
131	.670	325	494
134.5	.694	398	605
139.2	.728	510	775
142	.746	648	985
Gal. between 3rd and negative.			
142	.746	0	

Vacuum here was about 29.9 inches of mercury.

September 16, 1907.

Sample #3. Tungsten.

After admitting air and then readsorbing to as high vacuum as possible on a mercury pump.

Gal. between 3rd electrode and positive - not shunted.

Test #3.

Volts.	MM Deff	Amps x 10⁷
4.5	5.5	11
7.5	21	40
8.5	40	77
9.3	56	108
10.1	72	139
10.9	89	172
11.7	105	202
12.5	123	237
13	134	258
13.5	148	285
14	162	311
14.5	176	339
15	190	367

Was carrying lamp out of room, holding it gently in my hand, when suddenly it exploded.

September 17, 1907.

Lamp #1. Carbon 116 V.

Pumped out a second time on the mercury pump to 28 in. vacuum.

Gal. between 3rd electrode and positive.

Shunt = 887 ω.

Test #9.

At 145.2 V. lamp took .502 amps. and gal. was deflected 150 mm, which is equivalent to 37×10^{-6} amps.

Lamp was kept burning at this voltage and deflection of gal. kept diminishing. After 3 minutes lamp at 145 V. took .472 amps. and gal. was deflected 80 mm = 20×10^{-6} amps.

Vacuum is too low. Lamp bulb gets very hot and filament is only at bright red at 145 volts, where it should be white.

September 17, 1907.

Sample #2. Carbon - 113 ± V.
Galvanometer between steel electrode and positive
S. emf = 36.47 v.

Volts	Amps.	mm. Defl.	Amps. x 10²	Test #6.
93.1	.448	7	11	
100.4	.493	17	26	
108.2	.543	43	65	
113.9	.582	73	111	
120.7	.627	136	207	
124.9	.657	200	304	
128	.679	246	374	
133	.712	335	509	
136.2	.737	370	562	
140	.760	420	638	
143.5	.787	453	688	

Gal. between 3rd and negative

143.5	.787	0	

September 19, 1907.

Samp #7. Carbon 113½ V.
After reexhausting on mercury pump to practically 100 % vacuum = 761 mm of mercury with barometer at 761 mm also.
Osc. between 3rd electrode and positive.
Shunt 3.61 Ω

Volts	Amps	MA per = Milamps.		Test #7.
136	.730	330	5.192	
"	"	260	3.553	After ½ min burning
"	"	460	6.285	" 2 " "
136.5	.734	375	5.124	" 5 " "

Opened circuit momentarily and on closing again osc. oscillated between 150 and 310 mm. Oscillations grew more rapid and their amplitude diminished. After about 3 minutes they got to 200 - 260 mm.
Opened circuit momentarily again and on closing osc. oscillated between 160 and 240 mm.
Broke circuit several times

9/19/07

more after this but each time on removing galvanometer oscillated the same - between 140 and 200 mm deflection.

Power was off 1 hour & room and lamp stood cold for that time. Then at 135.5 volts and .773 amps. deflection of gal. was 59 mm. After lamp had burned about 1 min., gal started to oscillate again - very slowly at first and with increasing speed - between 50 and 140 mm.

Tested them as follows -

Volts	Amps.	MM DEF.	Amps X10⁴	Shunt = 36.47 Ω
95.6	.460	4	6	
102.1	.500	14	21	
109.5	.537	33	50	
117.7	.565	64	97	
119.4	.602	113	172	
123.1	.640	200	305	
126.8	.664	271	413	
132.6	.711	421	642	gal. did not
137.3	.739	519	790	oscillate during
141.7	.767	645	983	this test!

9/19/07.

Sample #2. Carbon 113½ V.

Readjusted a second time to 758 mm with barometer at 760 = 99.73 % vacuum.
Gal. between 3rd + positive.

Volts	Amps.	MM Def.	Amps X10⁶	Test #8.
142.3	.711	470	6472	- 3.61 w Shunt

Deflection gradually increased and went off scale (450 mm) in about ½ min. Then changed shunt to 1.806 ohms and kept lamp burning at 142 volts for a few minutes to note variations of gal. Found that the current did not fluctuate as in Test #7, but it would very slowly increase and then diminish in value while volts of at lamp remained practically constant. Joule readings at the maximum and minimum points as follows -

" 142	.713	580	15.77	
"	.710	430	11.660	
141.2	.703	640	17.354	

(over)

9/19/07

Samp #2. Test #8, cont'd.

Then made the following test at different voltages —

Volts	Amps	MM Def	= Amps X 10^4	
97	.471	0	—	1.806 w Shunt
103.9	.460	0	—	
110	.498	5	.135	
114.2	.522	12	.325	
119.1	.552	25	.693	
125.7	.593	55	1.573	
130	.620	106	2.974	
133.1	.639	162	4.393	
136.8	.663	215	5.830	
140.3	.689	307	8.324	
141.6	.697	360	9.762	

Kept lamp burning at this voltage for about 15 minutes and deflection remained constant.

Connected small Zn/KI/Cu cells in series with galvanometer so as to oppose flow of current thru galvanom. It took 50 of these cells to bring gal. back to zero.

September 20, 1907.

Sample #2. Carbon 113 ½ V.
Pressure 3rd time to 753 mm. with barometer at 757 = 99.47 % vacuum.
Gal. between 3rd and positive Shunt = 1.806 Ω.

Volts.	Amps.	MM Def.	Amps x 10⁴	Jset #9.
140.7	.579	190	5152	
120	.452	2	54	
122.2	.467	18	488	
126	.488	39	1057	
128.2	.500	52	1410	
131	.513	79	2142	
133	.522	98	2657	
136.3	.540	131	3552	
140	.562	195	5287	
142.1	.574	247	6697	
145.8	.597	326	8840	⊗ x

Deflections were fairly constant. Galvanometer did not oscillate.

(over)

9/20/07.

Notes on Test #9 of Lamp #2.

In this lamp a blue glow can be seen very easily, at the negative side of the filament. It diminishes in brightness from the end upwards and disappears entirely before reaching the curved point. It can be seen to the best advantage by looking along the filament from the tip end of the lamp. When viewed from this position it will be seen that the glow is emitted equally from all sides of the filament and extends outward about 2 or 3 millimeters.

When the 3rd electrode and positive lead are connected thru a low resistance shunt as in the preceding test, the 3rd electrode appears to get quite hot so that it glows dull red.

(over)

9/20/07.

Notes Continued.

If the 3rd electrode is dis-connected from the positive a curious phenomenon is observed. - Immediately there appears a bright blue glow at the positive side - but only around the ce-mented joint and the exposed part of the platinum sealing-in wire. This glow has very much the appearance of a CO flame and every now and then a tongue darts out in the direction of the negative. It is easy to conceive that if the lamp were heated up still higher, this tongue would finally reach across to the other side, forming an arc and fusing the platinum wires - as is sometimes done.

September 21, 1907.

Lamp #2. Carbon 113½ V.
Reexhausted 4th time to 748 mm. when barometer stood at 754 = 99.2 % vacuum.
Opal. between 3rd and positive.

Volts	Amps.	MM Def.	Amps X 10⁶	Test #10.
142.2	.510	280	427	36.47 w Shunt
142.3	.513	340	2244	8.05 w " - in ½ min
143	.518	470	2930	" " " 3 "
110	.359	0	0	8.05 w Shunt
116	.387	1	6	
122	.412	5	31	
127.2	.440	14	87	
130.7	.454	66	411	
132.8	.465	103	642	
134.9	.477	150	935	
137.6	.490	233	1484	
141	.508	388	2419	
143.9	.521	530	3304	⑤ v.
"	.522	650	4052	After burning 2 min
144.3	.540	340	7097	2.33 w Shunt
145.2	.522	255	5322	

September 25, 1907.

Lamp #4. Carbon 113 V.
Galvanometer between 3rd electrode and positive.

Volts	Amps	MM Def.	Amps. X 10⁶	Test #1.
135.5	.723	610	930	36.47 ω Shunt
137	.732	580	884	After 5 min. Burn
89.5	.422	22	46	25.6 ω Shunt
95.3	.459	27	54	
102.2	.502	36	75	
106	.528	46	96	
111.2	.562	67	140	
116.8	.598	106	222	
123.3	.641	190	397	
127.8	.671	256	535	
132.9	.708	352	736	
135.5	.727	412	862	
139.1	.750	475	994	
143.8	.785	536	1121	

Opened lamp and put in a globule of mercury. Then re-exhausted on Sprengel's pump

9/25/07.

Samp #4 cont'd.

to 100 % vacuum. Then exp= spotted lamp vertically so that the mercury was in the socket end - which keeps comparatively cool - and tested as follows :-

Volts	Amps	MM DEF =	Amps X 10⁶	Test #2.
127.8	.472	10.2	6.624	1.419 w Schmidt
128	.476	24.5	8.452	After 5 min. Burn
97.2	.471	3	.103	
104.5	.517	10	.345	
112.1	.568	32	1.104	
119.3	.600	71	2.449	
125	.653	163	5.623	
130.6	.698	310	10.695	
135	.730	490	16.905	
137.8	.750	630	21.735	

On this test the whole lamp was filled with a pale blue glow which did not seem to be any bioplates

9/26/07.

Samp. #4 cont'd.

around the negative leg than anywhere else. Globules of mercury condensed on the glass at the bottom, where it was cool.

Substituted a milliammeter for the galvanometer — between the third electrode and positive and tested at higher voltages as follows:—

Volts	Amps.	Milliamps.	Test #3.
125.9	.660	6	Samp. vertical
130	.692	10	as before.
134.9	.630	17	
137.2	.750	23	
141	.781	32	
144.7	.819	42	
147.7	.845	61	
130	—	10	Samp. laid down
135	—	17	so that Hg was
141	—	31	near hot filament
147.3	—	62	

(over)

9/25/07.

Samp. #4 cont'd.

Kept burning a few minutes at 147 volts until suddenly it arced from the 3rd electrode to the negative. The current at this moment must have been pretty high because the needle of the milliammeter was bent considerably. The arc also fused the platinum sealing-in wires and the copper connecting wires for a short distance down and copper was plated on the bulb at two spots opposite the terminals. The glass support too, was fused considerably and the bulb was also, at the spots where the copper was plated. The whole bulb was blackened with carbon.

September 27, 1907.

Samp^le 5. Carbon - 116 V.
A square of tinfoil is shellacced on one side of the exterior of the bulb. Samp^le also has the usual internal electrode of platinum.

At 146.8 V., lamp took .777 amps and "3-2" deflection was 155 mm. using an 8.05 w shunt = 9.66×10^{-6} amps. This was with the galvanometer connected between the internal 3rd electrode and the positive.

You tried using the external tinfoil electrode in place of the platinum 3rd electrode and found there was no deflection whatever, either with gal. between tinfoil and positive or tinfoil and negative.

9/27/07.

Samp. #5. Carbon 116 V.

Introduced a globule of Hg into lamp and rexhausted to about 99.93 % vacuum. Still could get no current between either positive or negative and the external electrode.

Connected gal. between internal platinum electrode and positive and tested as follows:

Volts	Amps.	mm. per.	= Amps. x 10³	Test #2
141.7	.750	605	20.977	Shunt 141.7 ω
97	.449	1	34	
104.1	.493	5	.172	
110.7	.533	16	.552	
119.9	.598	49	1.054	
124.3	.622	92	3.174	
129.9	.660	149	5.196	
133.8	.689	272	9.384	
137	.712	402	13.869	
140.5	.740	560	19.320	
	Gal. between 3rd and negative			
138	.720	302	.740	Shunt 90.9 ω

September 28, 1907.

Samp. #3. Immersion.
Introduced globule of Hg. and
exhausted lamp to 100 mm. max.
Gal. luminous 3rd and positive.

Volts	MM. Def. = Amps. x 10⁶		Test #3.
4.11	5	.9	No Shunt
7.00	9	2.0	
8.00	25	5	
9.00	47	9	
10.00	68	13	
11.00	91	17	
12.00	116	22	
13.00	155	30	
14.00	52	41	30.8 w Shunt

Gal. positive and slowly
swinging away off of scale after
lamp had been burning a-
bout one minute. Plugged
in larger shunt and reading
then was –

14.00	190	1.22	8.05 w Shunt

Deflection kept increasing
After about ½ min. more it was –

14.00	320	1.95	

9/28/07.

Samp #3 – Test #3, cont'd.

Allowed lamp to cool down and then tried at 14 volts again, using 8.05 w. about.

The deflection at first was 6 mm ($= 3.37 \times 10^{-6}$ amps) but after about a minute burning it suddenly went up as before to 13.5 mm. ($= 8.41 \times 10^{-6}$ amps) and then kept increasing slowly to still higher values. Do not know what the limit of this increase would have been because I was afraid it might arc and so opened the switch at about 400 mm deflection ($= 249.3 \times 10^{-6}$ amps.)

No deflection could be observed with the unshunted galvanometer between the 3rd electrode and the negative.

Samp showed the blue glow when burning at 14 volts.

October 5, 1907.

Sample #3. J. Mogstein.
Recharcoalized to 99.89 % vacuum
with Hg. fill in the bulb.
Gap between 3rd and positive.

Volts	MMPER	Amps. X10⁶	Test #4.
6.00	0	0	No Current
7.00	3	.16	
8.00	19	3.6	
9.00	40	.8	
10.00	62	12	
11.00	83	16	
12.00	105	20	
13.00	132	25	
14.00	174	33	Burned 3 min at this P.D. and "Z Z" was constant
15.00	250	48	"Z Z" constant during 3 min. burning.

October 7, 1907.

Samp. #2. Carbon.
Exhausted, then filled with Hydrogen and reexhausted to 100 % vacuum on Hg pump & gal. between 3rd + gasoline.

Volts	Amps.	MM. Defl.	Amps x 10⁶	Test #11.
141.5	.520	350	4781	3.61 W Schmit
142	.524	330	4508	9m 3 min.
115	.399	7	95	
121.5	.427	27	.369	
129.8	.463	78	1065	
135.7	.493	160	2185	
141.5	.522	297	4057	
143.8	.532	370	5054	
148	.557	520	7103	

Galvanometer Shunts – Constants etc.

Ohms		Constant	1 MM. Equiv. Amps. X 10^9	
∞	—	0	193	
2.33	7 C. $\frac{1}{10}$	108.15	20.973	
3.61	6.55 ‖ 9.05	70.9	13.664	
6.55	3.8 Man. $\frac{1}{100}$	39.47		
9.05	3.26 Co. $\frac{1}{100}$	32.3	6.234	
13.48	25.6 ‖ 66.5			
25.6	7 C. $\frac{1}{5}$	10.84	2.092	
36.47	66.5 ‖ 90.8	7.9	1.525	
60.94	66.5 ‖ 729	4.135		
66.5	3.8 Man. $\frac{1}{10}$	4.039		
74	90.8 ‖ 987	4.405		
90.8	3.26 Co. $\frac{1}{10}$	4.118	795	
400	729 ‖ 987			
729	3.8 Man. $\frac{1}{5}$	1.345		
987	3.26 Co. $\frac{1}{5}$	1.284		
1	Std	7.53		
1.718	2.33 ‖ 6.55			
1.806	2.33 ‖ 9.05	140.5	27.116	
1.417	2.33 ‖ 6.55 ‖ 9.05	178.8	34.508	

POCKET NOTEBOOKS

These twenty-nine notebooks, which generally measure about 3" or 4" in one direction and 6" or 7" in the other, contain notes, drawings, and calculations by Edison relating to a variety of topics, including storage batteries, phonographs and phonograph records, cement, x-ray tubes, and other experimental apparatus. Most of the entries describe experiments or other matters to be undertaken at the West Orange laboratory. There are also some speculative notes concerning electricity, acoustics, electromagnetic radiation, and thermodynamics, as well as occasional entries by other employees or experimenters. A few books appear to have been used by Edison at his winter home in Fort Myers, Florida.

The books have been filmed at a reduction ratio of 10:1.

Notebook, PN-19-04-00

This pocket notebook was probably used by Edison around 1899 for notes on chemicals, chemical reactions, cement, and experiments and projects to be undertaken. It consists of a promotional notepad distributed by the Standard Oil Co. and may have been used at Edison's winter home in Fort Myers, Florida. Included are a variety of chemical notes alluding to Henry Watts's multivolume *Dictionary of Chemistry*; notes on real estate, probably in the Fort Myers area; and notes on the chemical properties and varieties of cement. Among the experiments listed are several that involve "xyz rays."

Notebook, PN-99-00-00.4

This pocket notebook was used by Edison in 1899 or the early 1900s for lists of tasks to be undertaken. Included are notes relating to the supervision of experiments, to plant operations and outfit, and to other business matters. Among the activities listed or described are battery experiments, meter experiments, and work pertaining to magnetic ores, gold ore, and limestone. Also included are rough survey notes made by Edison at the Cahart property in Stewartsville, New Jersey, where limestone was later quarried for the Edison Portland Cement Co.

Notebook, PN-00-10-17

This pocket notebook contains dated entries from May and October 1900. Some of the May dates have been changed to October. The pages consist of blank forms printed for use at the New Jersey and Pennsylvania Concentrating Works at Ogden, New Jersey. The entries, all of them by Edison, appear on the back of the forms. Many relate to battery experiments, including cadmium and other electrodes to be tried and various electrolyte solutions to test. Among the other tasks mentioned are the supervision of construction at the Edison Portland Cement Co. plant and consultations with Walter S. Mallory and other employees. Also included are lists of books to order and phonograph experiments to perform.

Notebook, PN-00-01-01

This undated pocket notebook was used by Edison, probably in 1901. It may have been carried on his surveying trip to the Sudbury region of Ontario during that year. It contains a record of ore samples obtained and properties seen or discussed. The entries indicate the location and accessibility of mines, their owners, and property values. Other notes list possible sources of nickel elsewhere in Canada and the United States, often giving names and addresses of mining companies and other suppliers. Scattered pages contain notes regarding experiments on briquetting, battery plates and electrolytes, and other matters. Included are two pages with the heading "new force," which describe experiments to be performed with a Marconi device, electromotograph, and chalk telephone.

Notebook, PN-02-01-02

This pocket notebook consists of a promotional calendar printed for distribution by the Vulcan Iron Works Co. Three pages from January 1902 were used by Edison for notes regarding battery experiments to be performed, as well as a briquetting experiment. Most of the proposed battery experiments involve the use of various electrolyte solutions.

Notebook, PN-03-02-10

The one dated entry in this pocket notebook is from February 1903. All entries are by Edison. The book contains notes and drawings pertaining to experiments to be performed, including work on batteries, electric meters, lighting, and x-ray apparatus. Among the employees mentioned in relation to individual experiments are Cloyd M. Chapman, Frederick P. Ott, John F. Ott, and Charles N. or Albert F. Wurth.

Notebook, PN-03-10-06

This pocket notebook consists of a diary for 1902. It was used by Edison during October 1903, September-November 1905, January 1906, and possibly at other times for notes and drawings regarding experimental work and other tasks to be performed at the laboratory. There are numerous proposed experiments relating to the chemical composition of components for Edison's alkaline storage battery, along with others pertaining to the location, assay, refinement, and use of nickel and cobalt ores. Some of the entries identify various groups of test cells, while others list experiments involving ores from the Darby mine in the Sudbury region of Ontario. There are also entries concerning phonographs, electromotographs, and operations at the Edison Portland Cement Co. plant. Among the many employees mentioned in relation to individual tasks are Jonas W. Aylsworth, Emil Herter, Walter E. Holland, Walter S. Mallory, and Peter Weber. In addition, there are some entries pertaining to business, clerical, and family matters. These include one note about sending money to the Edison children for Christmas and reminders about communications with Sigmund Bergmann, Frank L. Dyer, and William E. Gilmore.

Notebook, PN-04-06-04

This pocket notebook was used by Edison during the period June-October 1904 for notes on experimental work to be performed. Among the experiments described are many that pertain to the chemical composition, construction, and electrical capacity of Edison's alkaline storage battery. In some cases Jonas W. Aylsworth is indicated as the proposed experimenter. Also included are several pages of rough calculations, a list of the number of employees working for various departments of the Edison Storage Battery Co., and a note about a worker at the Edison Phonograph Works.

Notebook, PN-04-07-21

This pocket notebook was used by Edison and an unidentified employee, probably during the summer of 1904. Many of the entries relate to production costs for Edison's alkaline storage battery. Included are labor distribution figures and notes on piecework rates, materials, and other manufacturing costs. There are some similar figures for the Edison Portland Cement Co. In

addition, the book contains entries by Edison regarding experiments to be performed, including work on storage batteries and a Lansden electric vehicle. Also included is a list of machinery necessary for manufacturing rubber parts. Inserted into the book is a report on labor and material costs at the Edison Storage Battery Co. works in Glen Ridge, New Jersey, for the week ending July 13, 1904, along with 2 pages of loose notes.

Notebook, PN-05-02-07

This pocket notebook was used by Edison during the period November 1904-February 1905 for notes on experimental work and for lists of tasks to be performed. Many of the proposed experiments pertain to the chemical composition, construction, and charge and discharge conditions of storage batteries. Included are entries describing groups of test cells, some with nickel flake elements in their electrodes. There is also a note by Edison reminding himself to see Frank L. Dyer about filing a patent application on the nickel flake. Among the employees mentioned in relation to individual experiments are Ralph Arbogast, Jonas W. Aylsworth, and Walter E. Holland.

Notebook, PN-04-12-27

This pocket notebook was used by Edison during the period December 1904-March 1905. It contains notes and drawings pertaining to experimental work to be performed and reminders about business and legal matters. Many of the proposed experiments relate to the chemical composition of components for storage batteries and to the construction of groups of test cells. Included are tests regarding the charge and discharge of Edison and Gibbs cells, as well as experiments with nickel flake electrodes. Also included are notes relating to patent questions for Frank L. Dyer; business matters to discuss with William E. Gilmore; a plant operations matter for Emil Herter at the Edison Portland Cement Co. works; and questions about graphite for Edward G. Acheson. The undated entries at the beginning of the book may have been made at the Edison Portland Cement Co. works in Stewartsville, New Jersey. Among the employees mentioned in relation to individual experiments are Jonas W. Aylsworth, Robert A. Bachman, John F. Ott, and O. A. Rogers.

Notebook, PN-05-03-05

This pocket notebook consists of a calendar for 1905. It was used by Edison during March 1905-April 1906, and again during early 1908, primarily for notes regarding experimental work and other matters to be undertaken at the laboratory. Many of the proposed experiments pertain to the chemical composition and performance of Edison's alkaline storage battery. These include investigations of swelling in the positive electrode pockets, tests of various tubes for the same purpose, related chemical research, and the notation of mileage and routes for an electric vehicle. There are numerous experiments on metallic flake for battery electrodes, including one on cobalt flake marked "Curious!" A few notes and drawings relate to experiments with phonographs. The book also contains notes about the location and availability of cobalt ores in North Carolina and elsewhere. The North Carolina entries are copied from a book identified as "Wurtz." Included as well are notes about arsenical compounds and reactions; notes about the properties of bismuth; an entry by Edison reminding himself to notify Frank L. Dyer about filing a patent application on

the use of cobalt in storage batteries; and some rough calculations and measurements, including cost analysis figures for the Edison Portland Cement Co. works. Among the employees mentioned in relation to individual experiments are Ralph Arbogast, Jonas W. Aylsworth, Otto Groethe, Frederick P. Ott, John F. Ott, and Ludwig F. Ott.

Notebook, PN-06-00-00

This undated pocket notebook was used by Edison, probably during 1906. It may have been used at his winter home in Fort Myers, Florida. Included are descriptions and lists of experiments to perform, including work on phonographs, storage battery components, electrical rectifiers, telephones, thermocouples, and "wireless." The entries contain Edison's speculations regarding magnetism, the chemical properties of various metals, and the nature of electricity. There are also notes on the "Edison effect" and on work by Michael I. Pupin and other scientists. Among the employees mentioned in relation to individual experiments are Charles Daily, Otto Groethe, Walter E. Holland, and Frederick P. Ott.

Notebook, PN-07-00-00.1

This undated pocket notebook was used by Edison, probably during 1906 or 1907. It resembles PN-06-00-00 in content. Included are lists and descriptions of experiments to perform, as well as more speculative notes regarding the "Edison effect," x-rays, electricity, "wireless," and the properties of light and of metals. Many of the experiments pertain to the chemical composition and construction of storage battery components. Others relate to thermocouples, electromotographs, and acoustic devices. Among the employees mentioned in relation to individual experiments are Ralph Arbogast, Charles Daily, Walter E. Holland, Frederick P. Ott, John F. Ott, and O. A. Rogers.

Notebook, PN-07-02-04

This pocket notebook contains two dated entries from February 1907. It was used by Edison for notes on experiments and other tasks to be performed. Many of the proposed experiments pertain to storage batteries, phonographs, and related chemical research. Included are entries describing groups of test cells, outlining chemical experiments with tungsten and tungstate compounds, and remarking upon a "new stuff" made by Jonas W. Aylsworth (possibly a phenolic resin). There is also a drawing of a phonograph reproducer, with a notation that it was given to patent attorney Frank L. Dyer. Among the employees mentioned in relation to experimental work or business matters are Thomas D. Greenley, Otto Groethe, Emil Herter, Frederick P. Ott, John F. Ott, Ludwig F. Ott, and Herman Wolke.

Notebook, PN-07-03-02

The one dated entry in this pocket notebook is from March 1907. The book, which was probably used in part at Edison's winter home in Fort Myers, Florida, contains notes by Edison regarding experimental work and other tasks to be performed. Included are experiments pertaining to x-rays and "xyz rays," the "Edison effect," electromotographs, electric lights and rectifiers, "wireless," and batteries. Some of the proposed experiments involve the use of radium, photographic paper, fluorescent crystals, and cocaine. One experiment involves the lamp of a projecting kinetoscope; another relates to the growing of a plant in the dark while watering it with

chlorophyll juice. The entries in the first half of the book are more speculative than those in the second half and include a reference to an unknown ray in the ether. The last page contains a list of landscaping tasks at Fort Myers. Among the employees mentioned in relation to individual experiments are Ralph Arbogast, William G. Bee, Thomas D. Greenley, Otto Groethe, John F. Ott, Ludwig F. Ott, and O. A. Rogers.

Notebook, PN-07-00-00.2

This undated pocket notebook was used by Edison, probably during 1907. It includes lists and descriptions of experiments to perform, reminders about patent and business matters, and notes taken from a book or books on the recovery of silver from nickel and cobalt ores. Many of the experiments pertain to the composition and manufacture of storage battery components and to related chemical researches. Others deal with phonograph reproducers, the composition of phonograph record blanks, cement kilns, and electromotographs. Also included are a number of speculative notes on the properties of light, the nature of electricity, and the use of cocaine as an anesthetic. Among the employees mentioned in relation to individual experiments are Ralph Arbogast, Thomas D. Greenley, Walter E. Holland, Frederick P. Ott, Ludwig F. Ott, and Charles N. or Albert F. Wurth. Employees mentioned in regard to other matters include Frank L. Dyer, Walter S. Mallory, John V. Miller, and H. I. Moyer. In one case Edison considers notifying Dyer about filing a patent application on a method for making metallic flake for storage batteries. Elsewhere there is a reminder to write Mallory about bauxite and a blast furnace.

Notebook, PN-07-06-15

This pocket notebook was begun by Edison in June 1907 and was probably used until mid or late 1908 for notes and drawings regarding experimental work and other tasks to be performed at the laboratory. Many of the experiments pertain to the composition and performance of Edison's alkaline storage battery. Others relate to phonographs and phonograph records; radium, "scintillation," and radiation; the chemical properties of boron and boron compounds; and Edison's kinetophone. Among the employees mentioned in connection with individual experiments are Ralph Arbogast, Walter E. Holland, Alexander N. Pierman, and Herman Wolke. The book also contains numerous entries regarding patent, business, and personal affairs. Included is a reminder to pursue a patent on a "new kiln aging process" for cement and to evaluate recent patents on phonograph record blanks. Also included is a comparison between process patents and musical copyright. In addition, there are notes pertaining to Edison's investments, the Essex Press, the Douglas Phonograph Co., the costs of cement production, and market shares among motion picture companies. Employees mentioned in regard to these matters include Frank L. Dyer, William E. Gilmore, and Alphons Westee. Among the entries of a personal nature are notes on medical books, including one work by William Osler and another about intestinal diseases, and a remark about "setting [the] NY Sun right" on who invented the kinetograph.

Notebook, PN-07-09-15

This pocket notebook contains dated entries from September and October 1907. It was used by Edison for notes and lists regarding experimental work and other tasks to be performed at the laboratory. Among the experiments listed or described are many dealing with alkaline storage batteries and phonographs. Other entries pertain to electromotographs, rectifiers, telephones, telegraphs, and thermocouples. Also included is a suggestion about using magnetic markers on films and records to start moving pictures and sounds simultaneously on the

kinetophone. Among the employees mentioned in relation to individual experiments are Ralph Arbogast, Thomas D. Greenley, Otto Groethe, Walter E. Holland, and Albert F. Wurth. The non-experimental entries include reminders about patents, popular music, and product names, along with notations regarding the authorized biography of Edison by Thomas C. Martin, Frank L. Dyer, and William H. Meadowcroft.

Notebook, PN-07-00-00.3

This undated pocket notebook was probably used by Edison during late 1907 and may have been used in early 1908. It contains notes and lists regarding experimental work and other tasks to be performed at the laboratory. Many of the experiments pertain to the composition and performance of alkaline storage batteries and to related chemical researches. The entries describe groups of test cells, indicate experiments with bismuth compounds, and list insoluble alkalis. Other experiments relate to dynamos, phonographs, the hardness of phonograph record blanks, molds and tints for cement, electromotographs, and an amplifying device. Among the employees mentioned in relation to individual experiments are Robert A. Bachman, Walter E. Holland, George H. Hooper, Jr., Ludwig F. Ott, and O. A. Rogers. There are also notations about patent, business, and clerical matters. Included are reminders to talk with Frank L. Dyer about a patent on a speaking kinetoscope and about possible legal action against a phonograph dealer; to suggest marketing ideas to William E. Gilmore; to instruct John F. Randolph about signing checks; to contact Walter S. Mallory and William H. Mason at the Edison Portland Cement Co.; and to dispatch William G. Bee to do research on electric vehicles licensed in different states. Also included are notes about printed sources that illustrate architectural details, for potential use with a molded concrete house; and listings of the numbers of motion picture films sold during autumn 1907. Three loose sheets containing entries by Edison on phonograph patents have been inserted into the book.

Notebook, PN-03-00-00

This pocket notebook was used by Edison, probably during 1909. It contains notes pertaining to finances, experimental work, book orders, and the supervision of employees. Included are calculations of cement production costs and projected profits from phonograph records, notations regarding accounts to be checked by Alphons Westee, and lists of patent questions to be asked of Frank L. Dyer. Also included are notes and drawings about battery experiments to be performed, including work on the composition and manufacture of components. Other experiments to be conducted relate to x-rays, motion picture film, phonograph reproducers, records and recording, phenolic resins, mechanical amplification, and tints and molds for concrete. Among the numerous employees mentioned in relation to individual experiments are Jonas W. Aylsworth, Daniel Higham, Walter E. Holland, and John F. Ott.

Notebook, PN-09-07-20

This pocket notebook was used by Edison during 1909 and 1910 for notes on experimental work and other tasks to be performed at the laboratory. Many of the experimental entries pertain to phonographs. Included are notes about various reproducers, possible amplification devices, phenolic resins and other materials for record blanks, cabinet design, and recording conditions. Also included are references to phonograph marketing, musicians, litigation, patents, and sales. Among the employees mentioned in connection with these matters are Jonas W. Aylsworth, Frank L. Dyer, William Goodwin, Walter H. Miller, Alexander N. Pierman, and Peter Weber. There is also

a reminder to send private investigator Joseph F. McCoy to the Victor Talking Machine Co. works in Camden, New Jersey, and the American Graphophone Co. works in Bridgeport, Connecticut. Other entries indicate the number of musical selections from 1902 to September 1910, along with the amount of sales to March 1910. One notation providing the names of musicians is in an unidentified hand. In addition, the book contains notes on electric vehicles, storage batteries, cement production, and motion picture rentals. Employees mentioned in regard to these concerns include John R. Anderson, Jr., Herman E. Klefer, Walter S. Mallory, and William H. Mason. There are also entries pertaining to Edison's life insurance, the transfer of property to Mina Miller Edison, and the use of space at the laboratory.

Notebook, PN-09-08-10

This pocket notebook was used by Edison during 1909, although the inside front cover bears the date of April 28, 1919. It contains notes regarding experimental work and other tasks to be performed at the laboratory. Like PN-09-07-20, this notebook indicates Edison's renewed commitment to work on his phonograph toward the end of 1909. Among the experiments described are many suggesting new materials for phonograph record blanks, new reproducers, sapphire and diamond styli, and recording apparatus. Other entries relate to musicians and musical instruments for recording sessions, motion picture marketing and distribution, kinetophones, long tubes for battery electrodes, paints and tints for cement, and the cost of limestone. Also included are estimates of Edison's royalty income, along with reminders to inquire about the value of his property in Glen Ridge, New Jersey, and to check on patents for cement kilns, storage batteries with lithium hydroxide electrolytes, and new natural and synthetic materials for phonograph record blanks. Among the individuals mentioned in regard to experimental and other work are Frank L. Dyer, Otto Groethe, Daniel Higham, John Lansden, and Dyer Smith.

Notebook, PN-10-04-13

This pocket notebook contains one dated entry from April 1910. It was probably used by Edison at his winter home in Fort Myers, Florida, as well as at the laboratory in West Orange. The book contains notes regarding experimental work and other tasks to be performed. Among the experiments are many chemical researches relative to Edison's alkaline storage battery and to phonograph record blanks. Other experiments pertain to motion pictures, color photography, business phonographs, and phonograph reproducers. An entry marked "Big Scheme" proposes using heat from the Edison Portland Cement Co. kilns to generate electricity. The employees mentioned in relation to individual experiments include Ralph Arbogast, Walter N. Archer, Eben G. Dodge, Pursell Eggleston, Ignacy Goldstein, Thomas D. Greenley, and Walter E. Holland. The notebook also contains many notations and reminders about patents, production costs, marketing, and other business matters. Included are notes pertaining to recording artists Leo Slezak, Arturo Nutini, and Harry Lauder, and a reminder to send storage battery data and a catalog to "Jack" Morgan at J. P. Morgan & Co. Near the end of the book are tabulated costs for battery and cement production, statistics on the production of chemicals, and a financial profile of the Edison Portland Cement Co. as of October 1909.

Notebook, PN-10-05-01

This pocket notebook was used by Edison during 1910 for notes regarding experimental work and other tasks to be performed. Many of the entries relate to proposed applications for Edison's alkaline storage battery and to the marketing, sale, and performance of cells. Included are reports of road tests made with electric vehicles; statistics on the cost and efficiency of electric traction and on the use of electric trucks in New York City; notes on battery shipments, production costs, and related assets; and descriptions of experimental work on phonograph reproducers, recording methods, and cabinets. There are also entries pertaining to the hiring of Converse D. Marsh to promote the battery and Sydney W. Ashe to research its use in locomotives; a reminder to contact J. P. Morgan, Jr., or George W. Perkins about approaching the Southern Railway Co. for battery business; and occasional notations about cement, phonograph sales, and various advertising ideas. Among the employees mentioned in relation to individual tasks are John R. Anderson, Jr., Ralph Arbogast, Robert A. Bachman, Frank L. Dyer, Walter E. Holland, and Carl H. Wilson.

Notebook, PN-10-05-10

This pocket notebook was used by Edison in 1910 for notes regarding experimental work and other tasks to be performed at the laboratory. Many of the entries pertain to the composition and manufacture of phonograph record blanks and to storage battery electrodes. There are also notes on tungsten lamp filaments, color photography, cement production, and storage battery performance in electric vehicles. Among the employees mentioned in regard to experimental work are Walter N. Archer, William G. Bee, Charles Dally, Ignacy Goldstein, and Walter E. Holland. The book also contains many notations of a non-experimental nature. Included are reminders about music and musicians, notes on possible names for a new large-diameter amberola record, lists of employees, and ideas for promoting Edison's storage battery among owners of electric vehicles in New York and New Jersey. Tabulated data at the end of the book provide details regarding battery production, cement shipments, projected income, battery performance summaries, and the volume of cement necessary for a poured concrete house.

Notebook, PN-10-11-01

The one dated entry in this pocket notebook is from November 1910. The book was used by Edison for notes regarding experimental work and other tasks to be performed at the laboratory. Most of the entries pertain to storage batteries and phonographs, but there are also notes about telephones, chemical researches, and various uses for the phenolic resin, condensite. The battery experiments include modifications of battery cans, trays, rubber parts, and tubes, as well as variations in electrolyte and methods of manufacture. The phonograph experiments involve the composition of phonograph record blanks, recording apparatus, and reproducers. Also included are ideas for marketing the batteries and phonographs, questions about infringement suits and patents, and data on labor. In one entry Edison plans to divide the laboratory's engineering department into several departments: "Battery – Leland & Storage; Motors, Rectifiers; Kinetoscope; Phonoghs; Miscellaneous." In other entries he mentions the work of Leo H. Baekeland, proposes to have Paul H. Cromelin handle Edison products in Great Britain, plans to develop a $35 homless phonograph model, decides to check on the progress of submarine batteries, and questions whether Ralph H. Beach should run his battery-powered streetcars in New Jersey. Among the employees mentioned in relation to individual experiments are Jonas W. Aylsworth, Charles Dally, Frank L. Dyer, Miller Reese Hutchison, and George F. Scull.

Notebook, PN-10-00-00.2

This undated pocket notebook was used by Edison, probably during 1910 and 1911 and possibly as late as 1912. Several entries may have been made in August 1911, while Edison traveled in Europe with members of his family. The book contains notes and drawings regarding experimental work and other tasks to be performed at the laboratory. Many of the experiments relate to improvements in storage batteries, phonographs, and phonograph records. Other entries pertain to Edison's kinetophone, concrete cabinets for phonographs, educational films, and stereoscopic effects and color photography for motion pictures. Among the employees mentioned in connection with individual experiments are Ralph Arbogast, Jonas W. Aylsworth, Pursell Eggleston, Ignacy Goldstein, Walter E. Holland, Miller Reese Hutchison, and Alexander N. Pierman. The battery-related entries include notes on the composition and performance of cells and a list of sixty-nine items, entitled "uses for battery," describing applications in electric vehicles, tricycles, and submarines; in automobile and home lighting; in sailing vessels, with windmill power; and in other devices such as miners' lamps, burglar alarms, and dentist drills. Also included are entries pertaining to the manufacture of nickel hydroxide and to clutch devices for trucks. In addition, there are plans for making phonograph records out of condensite, shellac, hard rubber, and celluloid; proposals for recording popular songs and the sounds of naval gunnery; and ideas about marketing phonograph records. Among the individuals mentioned in relation to Edison's business affairs are Henry H. Harjes in Paris; Etienne de Fodor in Budapest; and his European representatives, Paul H. Cromelin, Maurice E. Fox, Thomas Graf, and John F. Monnot. There are also entries pertaining to personal and family matters, including references to the estate of John Kruesi and a draft telegram, probably to Edison's daughter, Marion Edison Oeser, regarding a rendezvous with his son-in-law, Oscar Oeser, in Switzerland.

Notebook, PN-Undated.19

This undated pocket notebook was probably used by Edison during the early 1900s. Included are notes about two chemical experiments, one involving rosin oil and lime and the other glycerine and other compounds. Also included are a drawing and some miscellaneous calculations.

Notebook, PN-19-04-00

This pocket notebook was probably used by Edison around 1899 for notes on chemicals, chemical reactions, cement, and experiments and projects to be undertaken. It consists of a promotional notepad distributed by the Standard Oil Co. and may have been used at Edison's winter home in Fort Myers, Florida. Included are a variety of chemical notes alluding to Henry Watts's multivolume *Dictionary of Chemistry*; notes on real estate, probably in the Fort Myers area; and notes on the chemical properties and varieties of cement. Among the experiments listed are several that involve "xyz rays." The book has been used in both directions. The last page contains a printed calendar for 1896 and an inscribed date of April 1919. That date may relate to the four- and five-digit numbers, possibly battery cell numbers, on the adjacent page and to similar numbers a few pages away. The front cover is stamped "Compliments of Standard Oil Company, Newark Branch, Newark, N.J." The pages are unnumbered. Approximately 35 pages have been used.

Our Standard Lubricating Oils.

CAPITOL CYLINDER OIL
MODEL CYLINDER OIL
SHIELD CYLINDER OIL
RENOWN ENGINE OIL
ELDORADO ENGINE OIL
ELDORADO CASTOR OIL
ATLANTIC RED ENGINE
MAGNETO MACHINERY
EXTRA GOLDEN MACHINERY
GOLDEN MACHINERY
UNION THREAD CUTTING OIL
WOOL OILS MINER'S OILS
LEATHER OILS GREASES
EMERALD BOILER OIL
ALL VACUUM OIL CO.'S BRANDS
600 W. CYLINDER OIL
ARCTIC ENGINE OIL
AND ALL PRODUCTS OF
PETROLEUM

Patented 1883, Mills, Knight & Co., Boston, N. Y. and Chicago.

STANDARD OIL CO., NEWARK, N. J.
Manufacturers and Dealers in all Products of Petroleum.

Mercuro-chloride of
Cerium Caloriles
Cubes

Chrysammates
remarkable Crystals
towards light.

Its a Condensation
product oxy Naphtalic
Acid.

Arsenic pentasulphide
gives large number
double salts
Lowitz 3rd Sup 129

STANDARD OIL CO., NEWARK, N. J.
Manufacturers and Dealers in all Products of Petroleum.

Deland

Peroxides Ba. Sr Ca insoluble
precipitate Hydrate within Carbon
plates & place them in solution
Peroxide Hydrogen —

Iodates of heavy metals Fe do
insol — Easily give up 3 at
Ox — leaving Iodide of the
metal —

Ferric hydrate completely
dehydrated by boiling up to
168 @ 200 cents in Conc
Sol of Chloride Calcium or
Sodium

Make Pearl O & Ill. Ind.
Ferric Hydrate described
Watts. p. 395 – There may be
the oxide & get from Monosulphide
there is 2 or 3 ways of making
by all
1 detts oxychloride top pp 378
Watts 379 –

See Watts 2nd Sup p 687
abt Ferric Chl –

Make some Magnetic
Hydrate & dry & test in
grid for storage for oxygen
element & also for
cond – the probable that
it should be used in delaunay
make several pie plates full –

also make mixture of $FeCl_2$
& Fe_2Cl_6 in right proportions
put in Carbon plate & ~~oxid~~
try for Delaunay

Nitride of Iron. Easily made
85% Iron. 1st Sup Watts. p 757

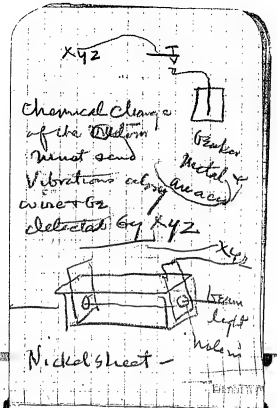
to get rid of basic salts when apply
Nit. salts by soda, boil the precip –

It is possible that actually sol
(illustration of Iron oxide
hydrate) ferric (dried)
matter which boils
Nit & Fe. Use p.s. from
Gordon & Alder Solution
of illustration formates
or best solution by Zinc chloride

Try ppt by boiling
Fe from also Ferric chl
by Zinc dust + Est of
Effect Zn by very weak
acid —

STANDARD OIL CO., NEWARK, N.J.
Manufacturers and Dealers in all Products of Petroleum.

Loco	200
Brooke	150
Ballou	145
Top	200
364	150
Emp.	250
Dynamo	150
Cleaner	125
Top Dyer	150
Furnace	175
Sample	125
Mizzy	175
Topmen	175
	2170



Try continuous – intermittent Gas and Liquids that absorb certain waves of light, Entering beam absorbed at right end hence a waves will pass Via W neo –
Try Conducting + Non Conducting liquids + metals –

Make telephone of
Try highly crystalline
Cast steel of a peculiar

Alluring between
the Crystals Make a
Current when current
passes — try best
Iron no alloy

STANDARD OIL CO., NEWARK, N. J.
Manufacturers and Dealers in all Products of Petroleum.

Thorite phosphorus, by
heat & then loses its
Capacity — This is restored
by electricity = for
fluorescent lamps

~~Cast steel plate [illegible]~~
~~Heat until phosphorus~~
~~Use~~ passes [illegible]
~~to~~ Combine a heating
& electrifying device
together so it will
not lose its power

Select 1/2 dry basil
Thorns alloys &
melt & pour in
Concentrated field
of mag & allow 1/2 outside
test etc for any difference

In Electric furnace
make alloys of
Rare Metals by mag
Oxides Etc & red. by
Charcoal, Sugar Charcoal
Etc also with a common
metal & oxide of a Rare
Etc =

STANDARD OIL CO., NEWARK, N. J.
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Pass a strong Current thro
the Vacuum deposit on
glass of gold plat, Silver
Copper, Nickel & at
same time notice any
Changes of a beam of
light by Zyz & spectroscope
also Try it in bridge
& see if light X Ray
Radium Heat Magnetism
Change Red —

C E Reed
Bartow Tube Wrk
Works Bartow Fla

Possibly a change Gallic Can be obtained with Prod + say Vanadium as a depolar ~~where~~ or other Metal with, Ammonia or the Sulphide or Chl ammine, with ammonia

The reason I did not get good results with Bismuth is that I didn't try it for a depolar + didn't have graphite – Try it again Bismuth peroxide is obtained by heating Bismuthic acid to 130 C it is an exothermic unstable oxide when heated gives O also when treated with K_2SO_4 – + Chlorine when treated with HCl –

This action is somewhat like Nickel –
Bismuthic acid is obtained by passing Chlorine into KOH containing Bi Trioxide in Suspension. This again is like Nickel –
Bismuthic acid is unfortunately a little Sol in KOH –

Gold tri hydroxide decomp when exposed to bright sunlight off O –
Photo for XYZ,
Chloro-auric acid
Bandwich light
Photo XYZ

When excess lime water added to platinic Chloride & exposed to light a white or yellowish precip of platinate of lime thrown down.

Phils. X Y Z

STANDARD OIL CO., NEWARK, N. J.
Manufacturers and Dealers in all Products of Petroleum.

Hugh McDonald
Lot next to Langford
35 large trees
Some grape fruit out
1 acre - 210 ft on
River highest
bank in town,
$26.50 —
80 ft deep on main st

McCl[illegible] place about
7 acres — $6000 —
pretty near all trees.

2 1/2 acres all in trees
200 trees — $2000 —
Next time —

4 acre piece 300 yards
from my place to Lake
town, 2500 not
improved —

Mrs Bates 1 1/2 acres
House on it fairly good —

asking 4000, think
can be bought for
3 or 3500 —

[THIS BOOK WAS USED IN BOTH DIRECTIONS. THE FOLLOWING PAGES WERE FILMED FROM THE BACK END FORWARD.]

'96	*Sun.*	*Mon.*	*Tues.*	*Wed.*	*Thu.*	*Fri.*	*Sat.*
Jan.	...	...	...	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	...
Feb.	...	...	...	...	...	...	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	...	...	...	...	...	...	...
March	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	...	...	...	...
April	...	...	...	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	...	...
May	...	...	...	...	...	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	...	...	...	...	...	...
June	...	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	...	...	...	...
	...	...	...	...	...	...	...

'96	*Sun.*	*Mon.*	*Tues.*	*Wed.*	*Thu.*	*Fri.*	*Sat.*
July	...	...	...	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	...
Aug.	...	...	...	...	...	...	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31	...	...	...	...	...
Sept.	...	...	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	...	...	...
Oct.	...	...	...	...	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
	...	...	...	...	...	...	...
Nov.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	...	...	...	...	...
Dec.	...	...	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	...	...
	...	...	...	...	...	...	...

Apl 1919 Ent

Burning Oils.

PRATT'S ASTRAL OIL,
DEVOE'S BRILLIANT OIL,
WESTMINSTER OIL,
WHITE ROSE OIL,
SPECIAL BURNING OIL
IMPERIAL BURNING OIL,

Above brands are all 150 W. W., and
guaranteed to be the best.

STOVE GASOLENE FOR VAPOR STOVES,
AND ALL GRADES OF BENZINE,
NAPHTHA AND GASOLENE.

Standard Oil Company,
NEWARK BRANCH,
NEWARK, NEW JERSEY,
C. E. YOUNG, Manager.

Duplicate Pads for use in this cover may be had upon application to Standard Oil Co., Newark, N J.

1637 25%

10 7/4 15%

10 7/6 — 25%

STANDARD OIL CO., NEWARK, N. J.
Manufacturers and Dealers in all Products of
Petroleum.

Total weight of a truss is as to the square of its length,

The amount or lbs of steel per foot of span is directly as to the span

20 ft span 6146 # lbs per ft
40 1219

but total wt goes as the square

20 ft Total wt 129 lbs
40 516

Ties in a pink truss are only 3/10th of its entire weight.

In a Funk bins of with a
rise of $\frac{1}{5}$ the weight be
8000 lbs the raise is
reduced to 1/10th the
weight will be 16000 lbs.

Portland Cement
In large work "Displacers" can be
used - each must not be nearer than
12 inches to well protected around it.

A cement requiring 2 hours or
more to set is called a slow cement

Cement is sound) slow setting
by long storage, its tensile strength
increases if kept dry & in a place
free from draughts. (German Spec)

French reject cement containing
over 1% Sulphuric acid or
sulphur in weighable quantities
or 4% oxide Fe2O3 or give a value
lower than $\frac{44}{100}$ for the proportion
between the base weight of the
combined silica & alumina in
the first part & weight of the
lime in the other part.

1130 20

1124 ~~35~~ 50

1124 5

1128 40

1124 15

Setting properties of Cement
Can be bettered to any extent (?)
modified by prolonged aeration,
Butler page 286

A cement is aerated in very damp
weather (?) air laden with moisture
Exposed portions leable to 62
Coagulated or what is known as
air set by which a great
part of its volatility when 62
lost

Aeration increases bulk of
Cement as much as 6% as it
absorbs water + CO_2

Aggregate (sand chunks) have
no dust + surfaces should 62
rough + porous

The greater the quantity of Aluminum present the quicker the setting. Being the most active ingredient it supersaturates the water first & commences to crystalize

It is preferable that a cement should contain less than 3% Magnesia the less the better —

Well burnt clinker dark porous & slightly underburnt is lighter. Underburnt still lighter while much underburnt is yellow —

A cement spread out on a tray for 3 years gave a good result as a valley portion in a closed car.

If a cement containing gypsum is permitted to stay in bulk stock for several days it develops poor strength at the early date of testing

Causes of retardation of setting by gypsum due to formation of Sulphis-Aluminate Lime

No aluminate of lime is dissolved ~~when~~ in water, when a mixture of sulphide Lime & Slaked lime is shaken up with water. The aluminate of lime in Cement is then hydrated slowly

Aluminate of Lime is the cause of rapid setting

If there is no free lime in the Cement gypsum will not prevent the proper setting

To accelerate Cement gypsum was added to act in 3 hours on neutralizing free lime by Carb Soda. It act in 30 hours

No gypsum

A cement containing gypsum exposed to the air ~~gradually~~ slowly becomes quicker setting

Made a small quantity of Slaked Lime be added it is overdoned above setting

The free lime previously in had become Carbonated by the absorption of CO_2 from the air

Gypsum is generally mixed with the clinker before grinding but is not easy to do it properly

Cement containing an excess of Clay is generally very quick setting & is never very strong

Cement can be used
20 deg below zero if —
Hot water with salt in it
is used, There is an after
Efflorescence

Lime combined as silicates
& alumina are the active
ingredients of Cement the
quantity the % of these Che
determines the Cement,

2 Cement having same
analysis, ground & burnt
the same degree of hardness
one good the other utterly
bad because possibly one
had the ingredients badly
mixed

2% gypsum added to Cement in a
closed flask
Initial set after mixing

1 day	3 hours
1 month	2 h 50 m
2 "	1 h 30 m
5 "	— 10 min

Above cement with gypsum should
not be stored over 2 months.

1 Sample Cement, initial set

0.5% gypsum	7 minutes
1.0% "	50 "
1.5 "	2 H 40 "
2.0 "	2 " 57 "
3.0 "	3 "
4.0 "	3 "
	3 " 30 "

gypsum generally increases
strength Cement when less
than 2%

Aluminate of Lime is insoluble in a saturated Solution of Lime

2% Gypsum allowable but making cements rendered sufficiently slow setting with 1/2 percent.

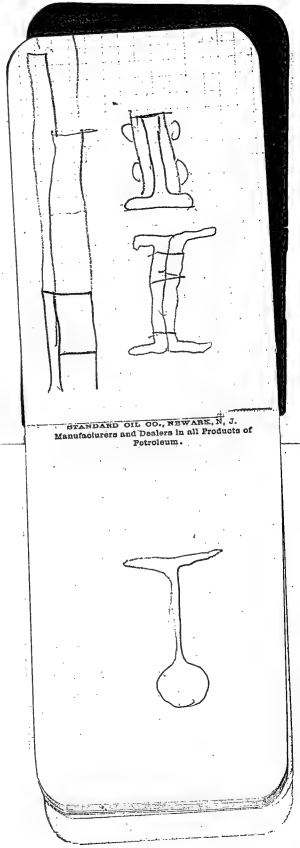
long aeration will do same thing as gypsum, the aluminate of lime becoming air hydrated ~~but little air slaking takes place~~ ~~cement is by time turned to hydrate~~ ~~hydrate~~

A cement which blowed by Faija test became sound when ground to pass 180 mesh by same test

The defect of fine grounding is to cause cement to set quicker, the aluminate of lime dissolving & Gypsum coagulating with great rapidity —

Same Cement put		Tensile
32 g Cement	5 cg H_2O	412
"	6 "	440
	7 "	367
	8 "	314
	9 "	214
	10 "	182

5 cg too dry. 6 cc is right


STANDARD OIL CO., NEWARK, N. J.
Manufacturers and Dealers in all Products of
Petroleum.

Dand Cial Great Trial 60th
Treat-and showed by
trials - defect of sand -
that it requires 28 days
to be of value —

Notebook, PN-99-00-00.4

This pocket notebook was used by Edison in 1899 or the early 1900s for lists of tasks to be undertaken. Included are notes relating to the supervision of experiments, to plant operations and outfit, and to other business matters. Among the activities listed or described are battery experiments, meter experiments, and work pertaining to magnetic ores, gold ore, and limestone. Also included are rough survey notes made by Edison at the Cahart property in Stewartsville, New Jersey, where limestone was later quarried for the Edison Portland Cement Co. The front cover is stamped "Pass Book" and is marked "file Sketch" in Edison's hand. The book contains 77 numbered pages, most of which are blank, followed by one unnumbered page.

PN-991-00-001

(1)

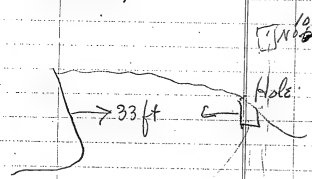
I have marked and tagged

Drillhole No 1 up to
44ft 1" - which was 5th
sample - Thursday 12 noon

I will be coming from
Hotel Sil

@ apparently a
Magnesian
outcrop
Sample 10

This is the outcrop on Cahart,



Says this hole was Limestone according to the assay -

No 106 Hole is almost within 4 feet of the line + he says he sent a sample of hole 106

(10)

(2)

If this is so then there is a ledge of Limestone abt 35 ft wide -

Slag - (Obsidian like)
Dust Coal burning under Coolers

Si	43.1
Al	21
Fe_2O_3	27
CaO	5.66

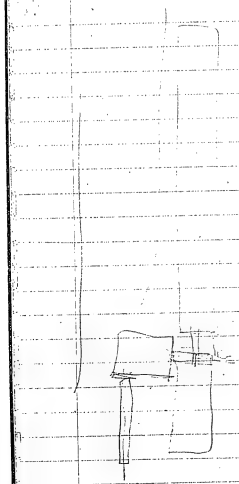
~~Hitts~~
CuOxplate –
~~Buy Dundonia [illegible] on [illegible]~~
~~Get Brooklawn Cemetery [illegible] Florida~~
~~See about work for [illegible]~~ –
~~See about [illegible] bolt mon~~ –
~~Stitch of Abrasive [illegible]~~
~~Jumpers Wanted~~
~~Last [illegible] all Hitts~~ –
~~Harmony Limited for Tune~~
~~Books [illegible] [illegible] [illegible] [illegible]~~
~~[illegible]~~ –
Start [illegible] from Clifton
~~See Sachs about Pin Shop~~
~~Have Civil Engineer Drive~~
~~Dock~~ –
~~Jumped Cities Leader~~ –
~~Stitch [illegible] Wheelers~~ –
How about 5th Roll 6th Pl –
~~Hunter on Shoe Order other plans~~
~~get 4 tables for Drafts~~

~~Chas Wilson Sheets~~
~~Cincinnati Enquirer 5.24.68~~
Got Copy Tuesday Lee Lane
Gardner
~~Chas Sheets~~
Bound and Cautioned
Read Report Prosecutor Hamilton
for breakin with Hilton glass
Fred & Chas Wilson
~~[illegible]~~
Wear Gloves for Lifting
Freddy Cut sneaker from soles
Core separate & carry separately
have to collapse 1 at a time
See Condition Quick & Set Back
drawings
Foo Vall Signature ~~X~~

213	batt	2348	973	64.78	✓
217	"	1979	1282	66.72	✓
218	"	774	713	87.31	✓
219	"	757	580	85.30	✓
224	Dal	✓			
226	Dal	✓			

Try oxdizg Cu plates in Carbolic acid with addition of NaCl NaBr NaI

NaCy or KCy –

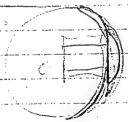


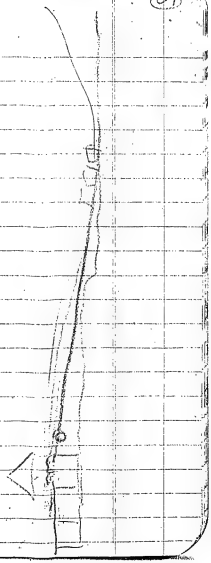
Hands wanted.
No 2 Mater weight
away for Bridgeport
Wrap —
38" Lathe wanted
quick —

Dip in Drill Hole 1

23 to 27 ft	15
27 to 31	16
31 to 39	8
39 to 44	15
44 to 48	17
48 to 55	14
55 to 60	5
63 to 67	3
60 to 62 ?	15
66 to 70	4
70	14
77	24
84	5
93	16
93 bottom	11
97	5
" top	10
102	4
" bottom	15

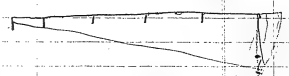
8'26 from Newark —





53 24

43 – 12



450
12
900
90
540
54
43) 125
43
116
108
8

Trench 138 to 212

2 to 5 ft	340	146	92 58
6@10	294	153	92 46
12@15	315	176	93 65
21@31 not exposed			
32@35	809	399	82 68
36@40	1300	523	76 96
41@45	599	302	87 17
46@50	341	245	89 29

Outcrop 60 ft W of 248
pure Quartz

Limestone Contact Trench Spritz gully
from Dal Trench 214 to 215
Feet

9 to 10	934	316		86 02
11 to 15	507	119	54	91 84
16 to 20	714	340		89 03
21 to 25	250	.80	.50	94 50
26 to 30	2.71	.72	.47	94 44
31 to 35	200	.75	.38	93 53
41 to 45	544	530		88 87
46 to 50	1026	540		79 18
56 to 60	693	552		86 02
61 to 65	1010	575		82 80
66 to 70	400	450		91 19
81 to 85	1553	405	142	75 48
86 to 90	1060	326	142	81 71
91 to 95	1345	725		78 17
96 to 100	1609	506	180	73 05
101 to 105	1574	673		73 33
106 to 110	1619	975		72 09
111 to 115	1472	556	169	73 46
116 to 119	616	663		87 09

graveyard gonatsville wardville

Mean road

225
226
232
227 — 750 ft abt
228
229

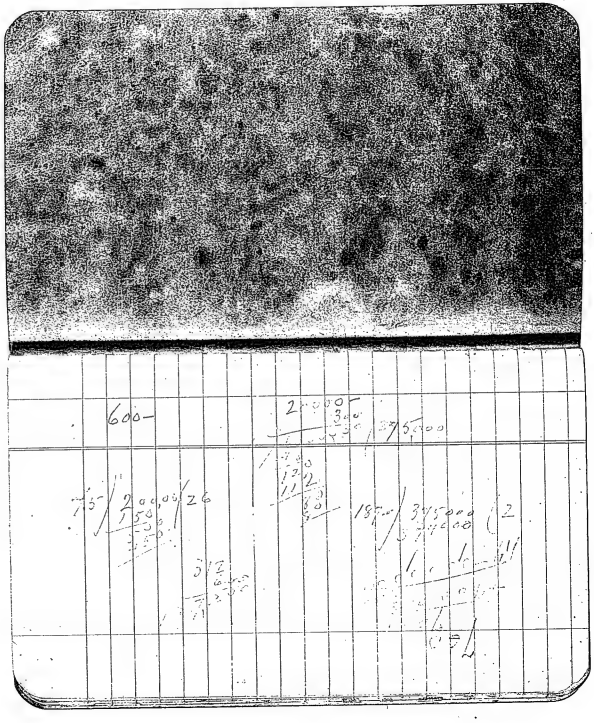
Clune — on Drill hill

Mean Dal

201
202
233 — 500 ft abt
203
230
231

1 470 000 000 | 91 857 000

91 800 000



Notebook, PN-00-10-17

This pocket notebook contains dated entries from May and October 1900. Some of the May dates have been changed to October. The pages consist of blank forms printed for use at the New Jersey and Pennsylvania Concentrating Works at Ogden, New Jersey. The entries, all of them by Edison, appear on the back of the forms. Many relate to battery experiments, including cadmium and other electrodes to be tried and various electrolyte solutions to test. Among the other tasks mentioned are the supervision of construction at the Edison Portland Cement Co. plant and consultations with Walter S. Mallory and other employees. Also included are lists of books to order and phonograph experiments to perform. The pages are unnumbered. Approximately 20 pages have been used.

Oct 17 1900 –

Try Ni pocket with CdO – reduce & plot curve use plenty Copper Then discharge on 4/5 External res – note volts & amperes – after dropping to 40 – reversed for 2 minutes with current equal to discharging current & note drop & keep doing this until gone = Theory either bad Carbonate or paucity of Na anions internally –

~~Reduce~~
Make some black oxide of silver & reduce by Hydrogen also Carbonate or chloride silver & then mould a plate & see if can oxidize by heat of not try current if OK try it with Cd pocket as a depolarizer

Oct 17 1900 –

Press some Copper plates just as light as they will hold to. Then ox by heat perhaps the trouble is in the Copper (12) fall Volts and in Cadmium – perhaps Cu_2O is one formed and needs double the Copper we have –

Test this Thus

~~(1) Pocket packed with Cadm~~

Cadmium plate full size label moved also Copper plate which has been reduced & oxdized to Cu_2O – discharge till Volts go to 36 – Then have another Cu plate & put it in place of Volts goes up

Oct 17 1902

Try the Experiment with
Cad plate & Cu plate with
10% Soda & 10% Sulphate Soda

ditto

Chloride Soda method see
if the pure alkali dont
prevent action of acid
on either plate & if so of
resistance is forward —

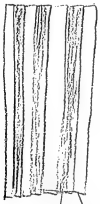
also phos soda & Oxalate —
would not the phos or Oxalate
precip all impurities in
alkaline solution
This might work with Zinc

Oct 17 1900

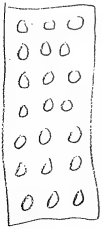
I noticed with the stick of Cd - that the oxide formed was apparently CdO may it not be possible that want of contact is the whole trouble with the Cd results if so we shall have to have thinner plates with Ni filament through them - or mixed Ni wires with Cd plated on + pressed in mixed to solidify —

May 17 1900

Target coated with Cd –



Ni .002 perforated



Cd plate .010 or .015
also perforated perforations
1/16
Then changed to grid

May 17 1900

Try plating on Magnesium with

straight strips with Copper same
size on both sides 1/4 inch apart
perforate magnesium plate well
with holes having strong edges —
see if can strip plating so
much on Edges round the Edges
of Copper & also Magnesium —
If that dont do it bore holes in
Copper also — If that dont do it
groove Copper in Center —

If that fails put rubber on Edges
Magnesium — If that fails then

Oct 17 1900

~~then try an [illegible]~~

~~as [illegible]~~ e

Make Magnesium Plate

to make lines sharp

Try a dead clean polished magnesium plate (no oil)

~~Wed~~ Oct 19 1900

Dont fail to try mixture of spongy metal or peroxide of Barium — May have to use 20% NaOH saturated with BaOH — so peroxide wont dissolve — use Cd or Zinc to get vallage of Zn use Zn NaOH — with Saturated BaOH —

Try 2 lead pocket with ~~one bulb only~~ ~~bulb in NaOH saturated~~ ~~with of lead~~ ~~Face~~ Lithage in both & NaOH saturated with lead oxide —

Oct 17 1900 -

Oxdyze some of the spongy Copper then mould plate of dentwork - mix some NaOH slurry to dampen & reoxidyze or slurry NH_3 - This will make plate more porous

Permanganate of Copper may be used & be a depolarizer or some other permanganate that's insoluble in Alkaline Sol & poked in grid or moulded —

Oct 17 1900 –

Chl Zinc Zinc plate –

Ca OH plate or in pocket,

— Carbon header –

Chlorine forms Hypochlorite

which is powerful

depolarizer — perhaps

Can get better grid —

Oct 18 =

Make some plates of reduced Copper & then put in H & heat again & try in battery

also Oxidize & reduce both by H & try =

Mount a plate of Cadmium & 2 plates Copper which has been reduced by Current & reoxidized by Current — & ~~test~~ reserve a little when 1/5 inch apart Cd in middle by having amperes Try 10 ~~15~~ 20 & 25% ~~NaOH~~ KOH LiOH, also with 15%

of the best solution adding say 10% of Sulphate of the alkali – Chloride – Phosphate, Oxalate, Fluoride, Tungstate, Molybdate, Citrate, Tartrate, Borate etc —

Covering Electrodes –

Membranes – Ferrocyanide –

Copper – ditto Zinc –

Tannides –

Collodion – Shellac, Gutta percha – Bitumen Asphalt, ~~Wax~~ Ceresine,

Nernst 344 p. – Conducting very slightly changed by solution in a

Collodion – (10) Conducting only slightly changed by gelatinization of the solution –

Starch, Phloracids, ferric hydroxide

Ammonium sulphide – Cupric

Sulphide K Iodide Fe Iodide

aq Iodide Iodine and

Mercuric chloride Tannin

glycogen Inulin, Osmic Albumin

While not included because under
same rules as Aluminum Hydroxide
= Hand cleaned K Soap = Rosin K Soap
Stearate or Na Soap =
Commercial Silicate soda -
[illegible]

Heavy Dry cells for transportation
Can [illegible]

Start on Monday night with Simpkins & go from I and to other on Element see what's been ordered, what drawings done & what is to be done — Have Complete list made out Tuesday & work on a book for my infant

~~See about [illegible] Stubbs~~

See Malling — ~~about this [illegible]~~

~~Speak to Bond — Work & Sub & S~~

~~See about Employees — Hollingsworth [illegible]~~

Vose about Compressible ~~— Get about Vulcan~~

Dangerous about Home Phone

~~Simpkins and 45 ft Gasoline — Rubber~~

~~order Two or Total S have ordered~~

~~Mold from mine for 2 or 3 [illegible]~~

S about [illegible]

D also about [illegible]

Drawing Models [illegible]

alterations

See Dandy [illegible]

Idlewood — also [illegible]

[illegible]

[illegible]

S about [illegible]

+ Tail — Stuffing [illegible]

+ [illegible]

also about Stand and Crowning

of idlewood + Head + T pulleys

D + S about Steam pipes

S about drawing Elevator

+ 3 H Rolls — Model screen

See New Model [illegible]

~~Coal fired on Cone Hearth Furnace~~

Hello Ceramic fired on Gorlen

~~Coal [illegible]~~

~~Sent home~~

~~Stabat arranging Xtra Conveyor~~

~~[illegible]~~

~~[illegible]~~

~~[illegible]~~

~~[illegible]~~

~~Called in to see [illegible]~~

~~Strings Bail~~

Get Muir Elements of Thermochemistry 1885

~~precipitate Hg_2O + Dry~~
~~then take best lampblack~~
~~mix Hg_2O with lampblack~~
~~say 2/3 lampblack 1/3~~
~~Hg_2O by bulk then~~
~~mix Coal tar~~

Make some Carbon plates
of lampblack with
smallest amount Coal tar
pitch + Coal tar say 25%
by wt + mould with
heavy pressure + bake
in muffle afterwards
bring up to high heat as
furnace up slowly.

Oct 24 1930

use these porous Carbon plate to absorb salts

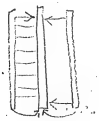
Try Concentrated Nitrate Hg. then dry + soak again until get all Carbon — then dip in KOH to precip Hg_2O in Carbon use as depolarizer

also test all the metals this way as depolarizer

Kott does not remake
Cy from the Cy — S
(Mendeleeff.) —

Chromic hydroxide, easily
oxidized

[THIS BOOK WAS USED IN BOTH DIRECTIONS.
THE FOLLOWING PAGES WERE FILMED FROM
THE BACK END FORWARD.]



Ton Branch single

left two (3 H) 8 and evident

wk dwat - count on

neighborhood -

Dock Rosser Ulmer

3 children - wkd 13 ½

Notebook, PN-00-01-01

This undated pocket notebook was used by Edison, probably in 1901. It may have been carried on his surveying trip to the Sudbury region of Ontario during that year. It contains a record of ore samples obtained and properties seen or discussed. The entries indicate the location and accessibility of mines, their owners, and property values. Other notes list possible sources of nickel elsewhere in Canada and the United States, often giving names and addresses of mining companies and other suppliers. Scattered pages contain notes regarding experiments on briquetting, battery plates and electrolytes, and other matters. Included are two pages with the heading "new force," which describe experiments to be performed with a Marconi device, electromotograph, and chalk telephone. The inside back cover contains notations by an unidentified person. The pages are unnumbered. Approximately 45 pages have been used.

Briquetting -

Try clay minimum quantity make good brick - also right consistency for briquetting - Bake at different temp -

Try clay mixed with slaked lime - different proportions boiling & consistency idea being decomp of SiO_2 forming Silicate lime at proper heat -

Try little K_2SO_3 for gelatinizing clay make brick.

Try stoneware ville chalk & bake full red to clinker -

Clergues Enterprises
financed Phelps
E B V Douglas
Broker Philadelphia
financing —

A Sudbury Mining man
has lot property but has
own but for sale through
him — J R Gordon C.E.
Sudbury

Mr Lockerby is Vice President of Dominion Mining Co Montreal —

Lockerby property — Worthington station
Station bought will tell where Mr John Dwyer is working 1½ m East of station
Lot 9 3rd sec
Division which of lot 10 ⊗
Lot 11 in 3rd sec owns 1/2 of 11 — owns 1/2 of lot 1 of 5 sec

1/2 of Lot 2 in
5 Concession

Rig up for small crucible melt of high up alloys to obtain one for high temp for letting down heat in new Thermo Expmt,

See if alloys have come from Britain –

Try thin layer of powdered Impotate Cardium – dilute flux opal dilute apatite between platinum & lead on Thermo having some trace of chromium also test with higher heat up to 350 @ 500.
dilute Tourmaline, as sure use sensitive gal of get any deflection to a counter

Better instrument would be
than dip needle - especially
for determining depth & quantity
ore -
Suggest 1st Coarse coil &
over this fine coil - a single
cell & make & break - normal
Earth magnetism not enough
to make sound in telephone
when coil rests on ground
ore perhaps it acts as a
magnet core for induction
coil -
Needle apparently
only measures direction
of lines - want but to
measure intensity
Magnetometer too slow
Cutting lines & reading
on a western Voltmeter
might answer - over

Therapeutics could be governed
+ which will be complicated –

Reduce ~~Therapeutics~~
Tolerance – Idiosyncrasy &
Idiosyncrasy & Idiosyncrasy at
dwell ness – & other things
Rig up a easily manipulated
small reckoning apparatus
so this class of experiments can
be made easily –

Great Lakes Mng Co
Room No 9 Huron
Block
cash
A. L. Eberson
Agent

Try plating Zinc from alkali onto strongly oxidized nickel plate also from scale or melted magnetite see if any local action —

Try Magnesium plate + Zinc plated on with Nickel Electrode CP ZnO + CP KOH closed cell — use strong current to plate with —

Try Zinc rod in Homopathic vial like cell to see if new organic alkalies dissolve also Nickel NiO_2 — test Ni_2O_3 in Solution + $Zn(OH)$ as well before testing Electrically

[illegible] Township [illegible]
South of Fairy
Lake on GTR
West North Bay &
Toronto –
find Geo Paget
Huntsville Station
Hedstrom Mine
owned by
John Hedstrom

John Custer &
Paget – Paget
Mininger –

Crush Canadian C C pyrolusite to
200 mesh - wash + dep in as
many kinds possible, Run assay

When about to Stevensville
investigate Cobalt Nodules -

Canadian Electro
Chemical Co -
Sault Saint Mary
Ontario
Rhodin - CP
Chlorine prod KOH

$15000. Blanks offers
this -
Lot 8 Con V Lorne
N W $\frac{1}{4}$ =

Teaming - 2.25 per day for pair horses & driver & we good drawing loam on sled will haul 2 ton - Can get into North Range 15 miles from CPR

Farmers in Cambrian Land have nothing to do in winter -

Govt will spend equal amount on a public Road -

Holland & Recess Buffalo have lumber road in which they are repairing now - runs close to mines -

Mt Carmel [illegible]

Left Bank [illegible]

[illegible] 25c

100 for the [illegible]

via Road to

N Range [illegible]

[illegible]

Canadian Mining
Review - Ottawa
Monthly Bell Editor
Robinson

Levick Township

3 Mines owned by Tough & Stokie — near Blacks Mine —

They have asked for 3 mines —

300 000 Cash or 100 000 " & 25c Ton Ry

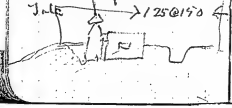
They might take a minimum guarantee of 100 tons daily at 50c ton & 20 000 Cash with guarantee of a 50 000 Mill —

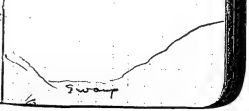
Above prices they say can be changed much more under pressure.

Block which is next to them wants 40 000 Cash for 2 mines will take some Cash & some in Mortgage —

Block has other mines near these the ground he wants $100 00 for. but will split up as above, & will 2 for 40 000.

Northampton mine Y Uenk is a Shute, about 125 ft at outcrop — 9 Look Sample every 6" across a Cross Cut, and to range the big samples are from bottom of shaft & picked samples in Cut showed very more several irregular stringers of solid ore to foot wall Cut of 5 say 30 @ 40 inches Pts the shorte Compliment Contact & ore wedges no Concentrating strongers but 6 wheelbarrows of Detritus & Talc





Schaefer Alkaloid works
Maywood. N.J.

Rossleur & Hasslacher are
evidently headqrs for Barium
Compounds

Castner Electrolytic Alkali
Niagara Falls Ontario
Arnold Hoffman Co
32 Broadway, make fine
pearly Caustic Magnesia, also
31 Bluemee Liquid power, —
get prices for 1 ton & cylinders

A W Miller Supt Oregon Mines
Exhibit Box 18 Fremont P.O.
Portland Oregon — gives me
the samples of Riddles Ni

Newly discovered nickel mine
in Serpentine Washington
Northwest Consolidated Mining
Co 2905 Hewitt ave
Everett, Washington,

Nicholas Rudebeck
$3210\frac{1}{2}$ Everett ave
Everett Washington — this
man had charge Washington
Exhibit at Buffalo, gave me
sample — says lots of Ni in
Serpentine in Washington — will
locate some or correspond

Riddles main deposit owned by
International Nickel Co, formerly
had offices in ~~Kansas~~ Chicago.
They have a man in charge at
Riddles, one in Livingston.

have considerable buildings + machinery - reported Rothschild bot up Central & closed mine

South of Riddles another mine
Thos Prater pres't Oakland Cal.

5 m SW Riddles Douglas Co.
American Nickel mine office
Chicago of H Winslow pres't
Glencoe Illinois - This may be
been mine who brot a wind Sample

N Hummel Editor Wadsworth
Dispatch Wadsworth Nevada
Can give me information about
Cottonwood Canyon Nickel mines

Rossland - Snowshoe mines
A. J. McMillan Rossland
He is manager The Co is
The British Columbia (Rossland)
Hologen Syndicate (Ltd) —
Rossland B.C. Go going
send another Bot - ore) fot

Thos W Gibson
Director Ontario
Bureau Mines
Toronto

Mining laws
Leased lands $1 per
acre 1st year
15@30 2nd year +
bot at 3 50

Sudbury Mines
Howland Mine Chamberlain
Nickel Co Worthington
Tolton Mine "

Dominion Copper Mine
[illegible]
[illegible]

Strathcona Deposit
Warnock Tp
G F Black Sudbury

Burke Falls, H McMurtry
Temiskaming district

Chapman Tp
Parry Sound Dist
John Schmler

Neil Martin
Winnipeg Manitoba

Hawk Lodge near
Ingolf Station
CPR Rainy River
Dist

Cobalt Mine	Little Turtle
Victoria Mine —	Creek Lower
	Seine Region —
Nickel Copper Co	Cobalt Lake Bay
Worthington Mine	Bureau Mines
[illegible] Hamilton	
[illegible] —	M. Ryan Kearney
North Worthington Mine	Locately Lot 32
Algoma — Robinson	Con 13 Tp Perry
Claims —	

Carlby J Bowman
Mocassin prop
near Rossport
Shore Lake Sup

Nickel Lake location
Rainy Lake

Carlby
O O'Connor
Seelbury
Net Lake near
Lake Temagami

Ontario's graphite
Big exhibit graphite
White Mica
Ottawa Cu

Caulbr
Bureau Mines
Split rock rapids
Musanabi, Ross,

another ~~[illegible]~~
Crown Land at
Massey —

J M Allen
Colorado Springs
Colo
Box 816 —
Interested in Riddles
Original Nickel
discovery =
Got following
information =
Internat Ni Co bought
out = Now Amer
Ni Mng Co

J R Ashley Yarb +
H. Controls it
as for as Allen
knows —
Retired Banker who
man said out to
trust — Rich —
he + few others
own it —
Owe $130000 —
for an interest

they acquired —
have 285 acres
all patented —
Have a Mortgage
Allen will find out
& write me Orange

Largest body of Serpentine
containing Chrome in
Eastern Townships Quebec
South Ewart Hampden
or 15 miles to Wolfestown
Serp is 1 To 3 miles wide

McCabe
Oregon — 3 locations
Middle 4 in fmt
"Pinery" or McKee Mountain
on upper Dado Creek
in Douglas Co & near
Rock Point in Jackson
Co last 2 places.
Depositit of Calcop —
12% Ni 2.5% Cu
No work done Estimn location.

Sudbury dist
Township Creighton
Water power 2500
HP — Owned by
McPherson & Gordon
14 miles from SS
Water power Dell
Township 4000 HP
7 Cochran Harbour
Mcht. Sudbury
9 miles from
Sud Owned

D'O'Connor,
Has wife Kept Edison Hotel
Schenectady.

Algoma Ni Co
owned by Jack
Cudhy Pres of
Mike C—
Connor owns
15000 stock

O'Connor mines
10 + 11 in 1st + 2nd
of Marin - Nickel

2 bodies - Hoists

at $5000

20 ft fall 2 miles
away on Spanish
thinks may be 1200 HP

Algoma Ni Co near
Marin in some
Marin Lot 11 and
Conesa RR track
runs right thro it

fall within a mile
20 ft owned by
Mc Fulgor Bro's
O'Connor 2 yrs
ago offd 15000
Wouldn't take it —
O'Connor said it's
Ham for 15000 —

O'Connor says 200
John Dwyer he knows
all about the Country —
Dwyer lives at Worthington

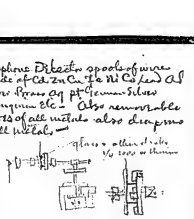
Neuforce
Marconi coherers, 20 metals,
Indication by fluorescence single crystals

use about 20 different metals
for rods

Electrometer graph. with Mirror Ray chalk
also telephonic —
Make Cylinders of Carbonates + phosphates
Arsenates Oxalates Ferrocyanides
Metalloids. Chromates, Fluorides
+ Borates of Ba Sr Ca Mg Al Zn
Sn Sb Ag Ni Co Fe Mn. Bi Sb Cu
Ur Th Hg Cd Pb also amorp Silica
Use for rubbing metals principally Pt
but try Mg Al Zn Cu Pb Sn Bi Sb Ag
Au Pr Pd Fe Co Ni Si Brass
Manganese other alloys Ferro-Silic

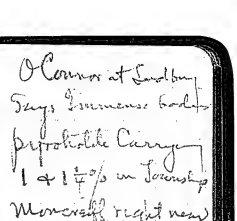
Dark box with graphite electrodes
also parcels of metals in powder Reduced
by hydrogen —

Telephone Directs spools of wire made of Cu. Zn. Cu. Fe. Ni. Cr. (or) Al Silver Brass Cy pt German Silver Manganin etc. Also removable Cores of all metals also drop wire of all metals —



on North ½ of 3 first Con —

O Connor at Sandbury
Says Immense bodies
profitable Carryon
1 & 1½ % in Township
Moreover right near
C P R —



J A Proctor Toronto
telegram say property
Lands North ½ Lots
1 2 3 4 first Conc.
South ½ Same lots in 2nd
Conc Hyman development

D Jacobs & Co
Where we boot
[illegible]
[illegible]

at Worthington Township

Cop Ni Co Herm 1/2 mile
station Westbury Con
mine at location adjoined
by Fraser on Westward
Col [illegible]
Next one N E in Hurum
~~[illegible]~~ Robinson O'Brien
wants 30000 yrs ago assays
more now — Dwyer says good
showing High grade —
offer this O'Connor at $20
offered d me to Dwyer at
$10000 =

in Orony N E part lot 6
3rd Conc & N W part lot
5 3rd Conc
owned by B. Miller Soo St Marys
ontario 2% draft

Dempsey had option on it for 5000, + didn't buy it
Says can get it again by
Feb 4th - & stand well great
bargain if selected

Send Miller some
glasses for
Medals

also Spring brass
Clips to set on
slides on needles

Sultana Mine 9 miles
from Northampton
good road - owned by
Chicago people 2 mills
Carpenter - 4 shafts, -
stopped work - people
came on from Chicago
last week had it
pumped -

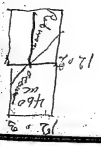
Chicago mining
4 milling Co - proved
as much only 1 lapse
from owners Co didn't
own it

Ross Mine 5% Cu
3.1% Ni North
Range 15 W from
CPR – Foy Township
Wants $25000.
Ryan has it for sale
will find out amount
of land Ross Mine
Ill patented =
Foy WR5 45 acres
WR6 – 31 acres

Prospector named
Drew saw me just
as was leaving for
home said he had
found Ni gossan in
Trill. 100 ft wide.
Vaccable geol. rules
He was hard up –
said for $200 he would
let me take it &
write letter to Shelley
to see it & if OK
apply for it & forward
Drew $25 – [illegible]

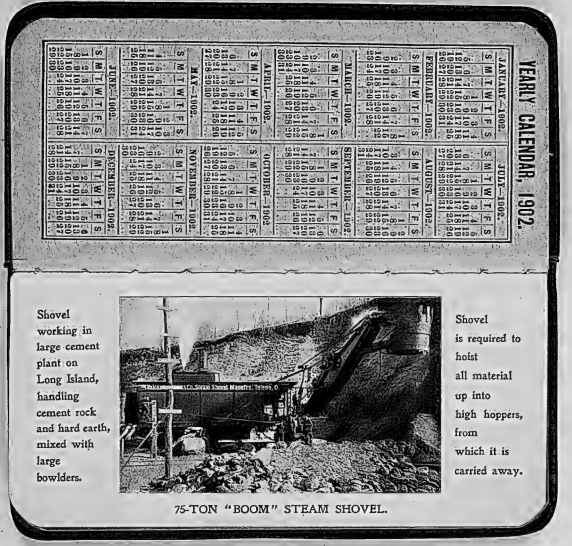
to pay Johnson
1 yst & allow m
a small royalty
to be decided
me — P2 to find
Weller & design
the letter told
John Take Charge
& go see it =
2

No 6 Pa Lot 6 " 5
No W 2 5 " 3
Thos L B Miller
500 st marks
Oct



Notebook, PN-02-01-02

This pocket notebook consists of a promotional calendar printed for distribution by the Vulcan Iron Works Co. Three pages from January 1902 were used by Edison for notes regarding battery experiments to be performed, as well as a briquetting experiment. Most of the proposed battery experiments involve the use of various electrolyte solutions. The front cover is stamped "1902 The Vulcan Iron Works Company, Toledo, Ohio, Manufacturers Steam Shovels, Elevator and Dipper Dredges, also Boiler Fronts."



Shovel working in large cement plant on Long Island, handling cement rock and hard earth, mixed with large bowlders.

Shovel is required to hoist all material up into high hoppers, from which it is carried away.

75-TON "BOOM" STEAM SHOVEL.

SUN.

MON.

TUES.

WED.
1
1

NEW YEAR'S DAY.

THUR.
2
2

10 grids 35% KOH.
10 " 10%
10 " 20% 1 part BaOH.
10 " 7% Sat 20 KOH 1 part

FRI.
3
3

BaOH.
10 grids 35% KOH
10 " " 20% KOH

SAT.
4
4

10 grids 20% KOH
10 Nigrids 20% KOH
1 part Strontia OH.

10 Ni grids 20%

SUN.
5
5

10 Ni 9 to 1
10 7 to 3
10 6 to 4
10 5 to 5
20 KOH.

Sunday after New Year.

MON.
6
6

10 Ni 4½ to 6 grids
Best Cameras on sale
Free to see Nikel
of dropped [illegible]

Epiphany.

TUES.
7
7

10 Ni 20 KOH, 1 part NH4
10 best Fe " "

WED.
8
8

10 Ni in nearly saturated
Sol of Ba OH.

THUR.
9
9

10 best Ben 842
10 " Ni grids

FRI.
10
10

To test best average Vaults
gwa should make
labors of C. Oxalate.

SAT.
11
11

Try changing upper
at Constant Voltage.

31 DAYS. JANUARY. 1902.

SUN. 12 — Tr. hand pitch powder
Tr. Ranunculus —
12

1st Sunday after Epiphany.

MON. 13 — Carb lime & Calcium
Chloride in equal
Ignition. melt at red
Not in Dis. in magnesia
13

TUES. 14 — Find — Tr. Bkg
14

WED. 15
15

THUR. 16
16

FRI. 17
17

SAT. 18
18

31 DAYS. JANUARY. 1902.

SUN. 19
19

2d Sunday after Epiphany.

MON. 20
20

TUES. 21
21

WED. 22
22

THUR. 23
23

FRI. 24
24

SAT. 25
25

Notebook, PN-03-02-10

The one dated entry in this pocket notebook is from February 1903. All entries are by Edison. The book contains notes and drawings pertaining to experiments to be performed, including work on batteries, electric meters, lighting, and x-ray apparatus. Among the employees mentioned in relation to individual experiments are Cloyd M. Chapman, Frederick P. Ott, John F. Ott, and Charles N. or Albert F. Wurth. The pages are unnumbered. Approximately 20 pages have been used.

PN-03-02-10

1 Johnatt about working
week hinges
Keeping back board

~~2 Norway Iron for [illegible]~~

~~3rd Wrath Cadmium~~
~~flash~~

~~4 About Nickel Symbol~~

1 = John get Norway Cors for meter -

2nd Boy for Fred at for Checks

3rd Board for holding checks

5 = Small holder for checks fitted to Matrosph for testing, Gas tubes

6" Call about making the 2" Extra arc furnaces welded gas-tight -

7 give list of stuff to Chapman —

Note, Hydrometer Lamplock as nomenclature with Schedule, phly gas for fluorescence tryg

Try Titanic acid with Lamplock press in bulbs then pack in charcoal & reduce in flame —

Also above with Ni Co & Fe to make alloy of titanium

Try Chromic oxide & Mo metal with charcoal as above

found out of stock last order from D'Ittamanjo
Alloys cromo & wolf are
are they —

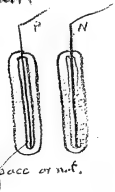
Put Alloys & Cr. also
old thermo alloys upon
Obsidian in Library

Feby 10 1903

Concentration storage battery
KOH, say 30% solution,
finely divided magnesia ignition
graphite both poles, charge one
pole Cmc KOH other pole weak
KOH, by using very thick
pockets. Ni pump ought get
strong current —

I think that possibly a search
for $Ni(OH)_2$ in battery — by using
compound oxides, Cr_2Fe
$MnFe$ $WOFe$ $WOMn$
$CrMn$ $CrWO$ $CrMo$
$NiWO$ $NiFe$ $NiMn$ $NiWO$
$NiCr$, $FeCr$ $CeWO$ $CeCr$
all hydroxides group together
or oxalates

Concentration cells might be made with Ni plates fed with a porous non Conductor.



possibly an 28 plate cell. 4 or 500 plates could be put in a Cooled with porous material. & quite good Capacity

possibly 400 plates can be put in cell & all plates provided with separator & then porous material perforated in with gas vents the porous material making one mass.

Conductors ~~[illegible]~~ Sodium phosphate

Conductors, possibly phosphate

Pari CrO_3 Mag - portland Cement & other cellulose porous material

Phos Zinc etc

2000 plates 10/000 thick.

10/000 porous stiff 10 of plates

200 this put in 5 cells in series

1 Volt, 200 watts.

Each cell EMF .2 Volt.

Zn Cd & Mg from peroxides

try Cd & Mg hyperoxides 644

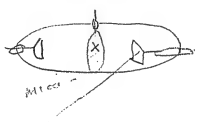
graphite mixed —

By fusion precious hung[illegible] with WO_3 the Compounds are formed —

Fe_2O_3 Co_2O_3 by heating

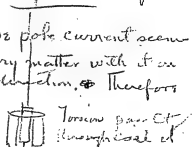
Cupric OH_2 in KOH,

If we are to consider a Solvent like water a Vacuum + X ray only given after Vacuum tubes contain [illegible] & Cases beyond then a Cellulose Cell with pt Electrode & very few ions should get X or some kind of ray from one pt Electrode —



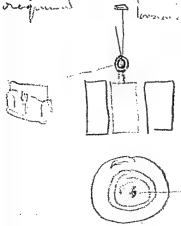
as X is said to throw a Shadow like Crookes Cross, will pt of use X rays first, then X ray is due to strike of cathode on metal, water, though Temp ray proceeds from it

Positive pole current seem to carry matter with it in same direction. Therefore

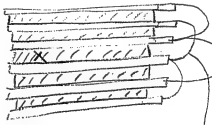


ought to twist a cylinder
outside Coil in same direction
as current. perhaps only
momentary may be common
trivial possibly very elaborate
overpower or heavy Current
required

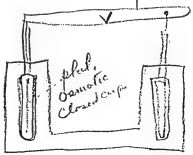
Mercury Bifilar



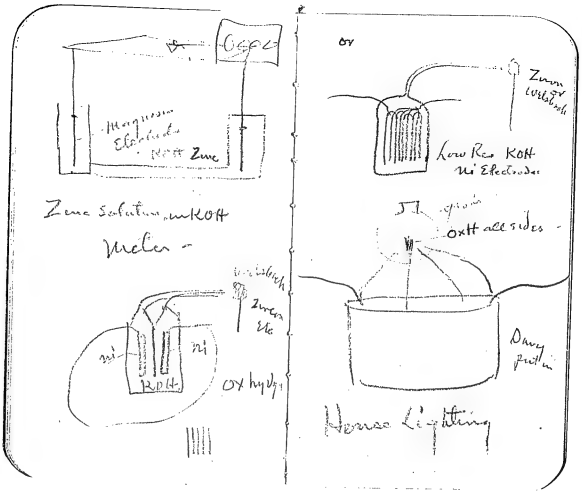
Condenser



X pressed Crib Stronticin wet Cloth
Michel sheet, Kept under
pressure with clamp or weight.



Meter


Magnesium Electrode
Zinc
Zinc Solution with KOH
Meter
Zinc Rod
Ni
Ni
KOH
Ox hydrogen
Ox
Zinc Wire
Low Res KOH Ni Electrode
Ox all sides
Dry Pellet
Hence Lighting

Static → → Porous stuff —

well static Current

dry it —

Wky with Chem Test pk

Recording pens as O always

burgoning volume to always

change (possibly Rubber cork + close wire stop a stopper

Rich) either of Solution

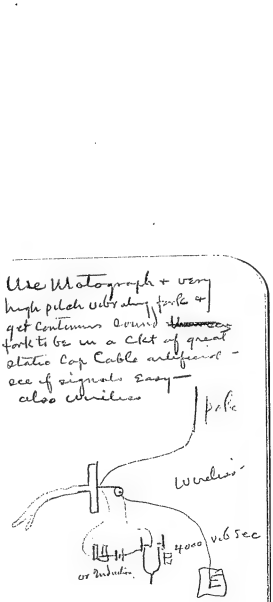
in big bottle for chem

Recording —

pen side more press

than other

Use Microtograph + very high pitch vibrating fork + get continuous sound ~~through~~ fork to be in a Circ of great static Cap Cable alongside — see if signals easy — also wireless



Try flexible metal Cab in phono Record Microtelo

~~[illegible]~~

Possibly - Cements put in phono record material might control by drying or Come out. —

Phenol Formo,

Phos Zinc

Chl + Ox Mag

dittto Chl + Ox Zinc

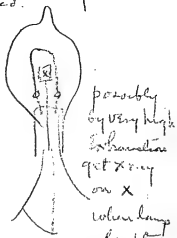
Gelatin with boracic

Sugar,

Gum Dextrin

~~Ess~~ Very hard Coal tar pitch

Possibly some of these Volatile Camphors might work as Recording Cylinder if pressed.




10 mm
28

Notebook, PN-03-10-06

This pocket notebook consists of a diary for 1902. It was used by Edison during October 1903, September-November 1905, January 1906, and possibly at other times for notes and drawings regarding experimental work and other tasks to be performed at the laboratory. There are numerous proposed experiments relating to the chemical composition of components for Edison's alkaline storage battery, along with others pertaining to the location, assay, refinement, and use of nickel and cobalt ores. Some of the entries identify various groups of test cells, while others list experiments involving ores from the Darby mine in the Sudbury region of Ontario. There are also entries concerning phonographs, electromotographs, and operations at the Edison Portland Cement Co. plant. Among the many employees mentioned in relation to individual tasks are Jonas W. Aylsworth, Emil Herter, Walter E. Holland, Walter S. Mallory, and Peter Weber. In addition, there are some entries pertaining to business, clerical, and family matters. These include one note about sending money to the Edison children for Christmas and reminders about communications with Sigmund Bergmann, Frank L. Dyer, and William E. Gilmore. The front cover is stamped "Thomas A. Edison." Approximately 80 pages have been used.

PN-03-10-06

Rowland artist 149

103 W 55th St

Sheet-1

Champion

55 Duane St

GG

HELP IN CASE OF ACCIDENTS

DROWNING.—1. Loosen clothing, if any. 2. Empty lungs of water by laying body on its stomach, and lifting it by the middle so that the head hangs down. Jerk the body a few times. 3. Pull tongue forward, using handkerchief, or pin with strong, if necessary. 4. Imitate motion of respiration by alternately compressing and expanding chest and lower ribs twenty times a minute. Alternately raising and lowering the arms from the sides up above the head will stimulate the action of the lungs. Let this be done gently but persistently. 5. Apply warmth and friction to extremities. 6. By holding tongue forward, closing the nostrils, and pressing the "Adam's apple" back (so as to close entrance to stomach), direct inflation may be tried. Take a deep breath and breathe it forcibly into the mouth of patient, compress the chest to force out the air, and repeat the operation. 7. DON'T GIVE UP! People have been saved after HOURS of patient, vigorous effort. 8. When breathing begins, get patient into warm bed, give WARM drinks, or spirits in teaspoonfuls, fresh air, and quiet.

SUNSTROKE.—There are two important indications for treatment—reduction of temperature and the use of stimulants. The patient should first be removed to a cooler spot if possible, or at least where shade can be secured. The treatment should be begun at once. The clothing about the neck and body must be either loosened or removed. Cold is particularly indicated in cases where there is great heat of the body, and delirium and convulsive movements are present. This means of reducing the temperature may be applied in the shape of cracked ice about the head and spine, or the use of cold water. If the heat of the body is very great, it may be necessary to wrap the patient in sheets wet with cold water. If there is, besides the great heat, evidence of serious depression, stimulants must be used while the cold is being applied.

BURNS AND SCALDS.—Cover with cooking soda, and lay wet cloths over it. Whites of eggs and olive oil. Olive oil or linseed oil, plain, or mixed with chalk or whiting. Sweet or olive oil and lime-water. Shock, which is always present in severe burns, requires the administration of stimulants. Pain is more constant and intense in burns than in any other form of injury, and requires sedatives, which should be administered by the medical attendant. Later on the appearances of inflammation and other complications are to be carefully watched for.

HEMORRHAGE.—The usual treatment is rest in the recumbent position; small pieces of ice should be freely swallowed, and the application of ice wrapped in a towel, or in an ice-bag, or snow, cold water, etc., over the stomach; hot applications may be applied to the extremities.

FIRE IN A BUILDING.—Crawl on the floor. The clearest air is the lowest in the room. Cover head with woolen wrap, wet if possible. Cut holes for the eyes. *Don't get excited.*

Wea. WED. JAN. 1, 1992 Ther.

98% - 20% 150 - 75 Dig

602 - 495 87
630 490 [illegible]
607 482 87
612 498 90
605 482 90
725 528 125 * 75 Pulse

* put - 90% by mistake for the sole range.

Wea. THURSDAY 2 Ther.

~~Thursday 1992~~

Wea. FRI. JAN. 3, 1902 Ther.

983 - 35% 150 - 71 orig.

690	395	137
660	450	130
717	550	132
690	455	132
650	450	130
600	450	130
600	450	130
650	450	130

290

Wea. SATURDAY 4 Ther.

3 5

345
35
425
35
375
35
325
35
300
35
265

Wea. SUN. JAN. 5, 1902 Ther.

988 - 20% 80 [illegible] 75 [illegible] orig.

592	425	86
617	442	93
575	467	96
592	350	100
583	417	101
558	425	103
575	408 -	105
566	408 -	105
600 -	400 -	107

Wea. MONDAY 6 Ther.

953

Wea.	TUES. JAN. 7, 1902	Ther.

Wea.	THUR. JAN. 9, 1902			Ther.
	First Run			
	75 Rate			
77-	1037	586	455	90 ~~75~~ 93
78	1038	556	470	88
76	1039	571	458	87
75	1040	560	470	85
77	1041	531	425	87
76	1042	587	431	88
	2nd			
	75 Rate			
	1037	586	488	90-99
	1038	582	463	88-100
	1039	585	505	85-96
	1040			
	1041	607	536	87-97

Wea.	WEDNESDAY 8	Ther.

Wea.	FRIDAY 10			Ther.
	1042	536	450	94 98

Wea. WED. JAN. 15, 1902 Ther.

Wea. THURSDAY 16 Ther.

Wea. FRI. JAN. 17, 1902 Ther.

Write Mallory about having Crucible steel wire — for belt lacing

also about taking up belts so often —

also support for Cooler, chilled or fine grain —

Wea. SATURDAY 18 Ther.

Wea. THUR. JAN. 23, 1902 Ther.

Wea. FRIDAY 24 Ther.

Wea. SAT. JAN. 25, 1902 Ther.

9 rain

				Wind	Shade
100	1043	1280	1130	80	86
70	1044	1299–1177		80	85
67	1045	1118–996		81	87
70	1046	1195–1075		77	92
68	1047				
	1048				
	1049				

Wea. SUNDAY 26 Ther.

Wea. MON. JAN. 27, 1902 Ther.

[illegible] Allen [illegible]
[illegible] Brewerk
[illegible] to see
[illegible]
[illegible] change must,

Wea. TUESDAY 28 Ther.

Wea. WED. JAN. 29, 1902 Ther.

Test 1/2 Caps powder [illegible]
def being [illegible] powder [illegible]
no 10% water in test no Dried
dead only [illegible]
powder in [illegible]

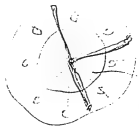
		1st Run 20%	75 rds	
75	1063	574	49%	86
80	1064	606	493	87
81	1065	608	493	89
76	1066	607	50%	82
79	1067	592	487	87
80	1068	585	47%	89

Wea. THURSDAY 30 Ther.

Wea. FRI. JAN. 31, 1902 Ther.

Wea. SAT. FEB. 1 Ther.

Wea. SUN. FEB. 2, 1902 Ther.



inch of

New Recorder longer
wood lever say 1 1/2
long - white pine —

Wea. MONDAY 3 Ther.

Wea. TUES. FEB. 4, 1902 Ther.

Wea. WEDNESDAY 5 Ther.

Wea. THUR. FEB. 6, 1902 Ther.

Oct 6 1903 —

Dipsomania Clock wound in
Kero with Chloroform in mg
also Kero with Bromine —
Try Hypo to harden surfaces
of Kerosene dissolves it, try
Bromine in H2O. — Gasoline
and other solvents, try Nitric
Conc — Vapors of Bromine
Devonald feels all the
virtues of Sagebrush.
Great many sound for one pound
Samples from Dr Dan Pierce

Wea. FRIDAY 7 Ther.

Hands soft & tender — Surgeon
Wash with Formic, get some
Denne pitch — Peruvian pitch,
Hand Condition pitch,

~~Move Piano & everything up~~
~~stairs up stairs with Dresser~~
~~Clean it out & put up regards~~
~~Have Spice Lick fixed & hail~~
roundtrip — Sale Cost for Thomp
to go on sale Fred & Ed Sunday
dolls up & down & Spice L

Wea. SAT. FEB. 8, 1902 Ther.

Wea. MON. FEB. 10, 1902 Ther.

door — ~~work towards~~

~~Got Wed. 6. Balls from~~
Lawrence

Try this — when room ready

Wea. SUNDAY 9 Ther.

Wea. TUESDAY 11 Ther.

~~Seckflowers'd Cant put in water~~
~~on short [illegible]~~
~~instead Water —~~
~~Seckflowers not [illegible] feeds~~
~~Cool Dryer —~~
~~Making what kind of~~
~~[illegible]~~
~~Sys-tem — [illegible]~~
~~[illegible]~~
~~[illegible]~~

Wea. WED. FEB. 12, 1902 Ther.

~~Wea. FRI. FEB. 14, 1902 Ther.~~

Try igniter charcoal that
will give best conduct in ROH,
400° with a charge
Nickel ore of port Colborne,
is not being treating properly
primary battery —

~~Workbench in Museum —~~
~~annex~~ stands — put in
38" funnel cut into - dells
by funnel —

Wea. THURSDAY 13 Ther.

Wea. SATURDAY 15 Ther.

Oct 5 1903

Have Roper [illegible]
~~Index in Blank Books~~ —
~~Hoop Book~~ - Hamilton
End of blank —

Claim Condon of patent
Rocks + neg heterogen
Speak of first patent
Rocks - in patent —

Wea. SUN. FEB. 16, 1902 Ther.

Wea. MONDAY 17 Ther.

Wea. TUES. FEB. 18, 1902 Ther.

possibly degree of electricity
also measuring neg. leaves
as sensibility of diamondes

See Marvies book in regards
Trompas —

Combination piston with wood
chamber — dull black
neg. leaves

Combination of a Rounder
neg. leaves neg. leaves
+ Replica with positive

Wea. WEDNESDAY 19 Ther.

Leaves [illegible] the dull
of bath [illegible]
have measured movement
beyond the [illegible]

Patent filter — Indexgraph
~~Home Attorney~~ and
Accordeon [illegible]
Mr Bailey 2 Nitro 1 Iron
Picket Out — 5 [illegible]

Wea. THUR. FEB. 20, 1902 Ther.

Wea. FRIDAY 21 Ther.

Oct 9 1903

Wea. SAT. FEB. ~~22~~ 1902 Ther.

Mussed funnel —
hard glazed surface on painting
got some hard pitch in
tray dep. mixed, heat
mixed a little, also dopping
it with paraffine —
Test being that was
will stand —

Write the makers
the 005 Rubber Linoleum

Zyn Rub Co
Linoleum
Oil Cloth

Wea. SUNDAY 23 Ther.

~~Opt Chem make some~~
~~001 002 003 & 004~~
~~Rub Linoleum also special~~
~~Lamps —~~

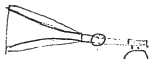
Depos Take out new Dia
as Telephone wrong shows
[illegible] after [illegible]
[illegible] —
also after test — from pa
Cumb. —

Wea. MON. FEB. 24, 1902 Ther.

Wea. TUESDAY 25 Ther.

Wea. WED. FEB. 26, 1902 Ther.

Buy an new piston patent with funnel like Alexander show funnel + all



patent the adjustable pressure foot + ball.
Sophine ball of a uniform size and to prevent hurling

Wea. THURSDAY 27 Ther.

pressure arm clean the spring

See what new things can be patented by Miller & P on Cotton

Wed. [illegible] piston so made will give a record which will not so Mr. Miller -

Wea. FRI. FEB. 28, 1902 Ther.

Wea. SAT. MARCH 1 Ther.

Wea. SUN. MARCH 2, 1902 Ther.

Iwa to and Klopstein
(must what he wants [illegible]
Def. El e el [illegible] [illegible])

Wea. MONDAY 3 Ther.

Wea. TUES. MARCH 4, 1902 Ther.

Wea. WEDNESDAY 5 Ther.

Wea. THUR. MARCH 6, 1902 Ther.

Cobalt, Chalcopyrite
Smaltite 1.35 [illegible] 1.82 Co
12.19 [illegible]
occurs in Mica schist,

Skutterudite As Co 20%
occurs in Hornblende
gneiss in Quartz in Norway

Cobaltite from 9 To 33%
Sulphur common
occurs in Mica schist
in Sweden

Wea. FRIDAY 7 Ther.

Gersdorffite from 0.26
to 14% Co 28% Ni –
S+As trace
occurs in decomposed
Blende + Galenite at
Rhosmaelle Pen

Wea. SAT. MARCH 8, 1902 Ther.

Co [illegible]
[illegible]
at Mt Sorgda [illegible]
also Ingalsbi also [illegible]
[illegible]
3 to 5% Co —

Allo [illegible]
[illegible] 3 p/p
5 + As - Bi
[illegible]

Wea. SUNDAY 9 Ther.

Chromite Co
[illegible]
Co from 0.55 to 3.14%
[illegible]

Wea. MON. MARCH 10, 1902 Ther.

Syepnopite.
5 - 30 -
34% Co
from Syepos [illegible] Rajpantanai
Indea [illegible]
[illegible] with pyrrhotite —

Cassiterite
Potapsco mine near
Ellicotts Cross Co Md
37% Co - 1.5 in Sulphide
also at Springfield mine

Annaeite. 43% Co found
in Chlorite Slate at
Mineral Hill at Mineral
Hill Maryland with
Calcopyrite Galena Bornite
+ pyrite —

Wea. TUESDAY 11 Ther.

Wea. WED. MARCH 12, 1902 Ther.

Germanite

$38 Ag 14 Zn 40 Pb 22

Zn 5 Co 11½ Cu 11½ Fe 7½

found with Quartz

Chalcopyrite

Utah ore used

in our Lunge

Chemical Laboratory

by Mr. Co parts

found in Utah

Wea. THURSDAY 13 Ther.

Spanuodot

As 43 Sb 20 Co 24½

Fe 12

found in ancient

slate with Lapis lule

in Province of Huasco

Chili

Wea. FRI. MARCH 14, 1902 Ther.

Allocdarite

$16 As 32 Ni 50

Zn 2 - Co 25½

Hungary

Large deposits Wad at

Martinsburg Lewis Co N.Y.

in seams

large deposits at Blue Hill

Wea Bay SATURDAY 15 Ther.

a Cobalt place in Maine

Cobaltiferous Wad

found at Sugar Bluff

South Carolina

24½ oxide Cobalt

& 76½ Mn O2

Wea. SUN. MARCH 16, 1902 Ther.

Erythrite

As 38 33%

Fe 3%

[illegible]

[illegible]

As 44 In 20 Co 9%

Wea. MONDAY 17 Ther.

Cabrerite

As 42 In 20 Co 4

Mg 10

in Sierra Cabrera Spain

in [illegible] Prom Spain

which is [illegible]

Lomchite & Angel which

Lomchite [illegible]

Prevents [illegible] Ni & Co

[illegible]

Wea. TUES. MARCH 18, 1902 Ther.

Köthigite

As 37 In 30 Co 7 Ni 2.

occurs with smaltite in

Germany

Pelgerite

Mineral of Cobalt

found in Uranium ore

in Joachimsthall

Wea. WEDNESDAY 19 Ther.

Lisloupite - Cobalt form

Co 7 Nickel

Called

Prizium

Remingtonite

Rose colored [illegible]

occurs [illegible]

Veins of Serpentine

which traverse Hornblende &

Epidote [illegible] near

Finksburg Maryland

Wea. THUR. MARCH 20, 1902 Ther.

Cobaltite
Co 2 to 4%
with [illegible] in a
Silver mine of Cobalt
[illegible] of [illegible]
Mr [illegible]

[illegible] of Co 1½-2% Co
in Sacramento.

Wea. FRIDAY 21 Ther.

IV XXXV

[illegible] Mn only [illegible]
in [illegible] while Co
in [illegible] in
pyrite – [illegible]

Wea. SAT. MARCH 22, 1902 Ther.

Phenacite
As 67 Sb [illegible] Fe 21
Co 4.6% Mn 1.14
found in mines of
Guadalcanal in
Andalusia Spain

Wea. SUNDAY 23 Ther.

Rabdionite
black [illegible]
Fe 45 Mn 23
Al 2 Cu 14 Co 5%
Urals Russia

Wea. MON. MARCH 24, 1902 Ther.

Rhagite

Bi 73 As 14

Co 1.47% Ca 2 [illegible]

Saxony

Roeslite

As 50 Co 13%

Ca. 21 Mg 4 [illegible] 10

Wea. TUESDAY 25 Ther.

Saxony

Spherocobaltite

As 61 Sb 2 Co 15%

Cu 4% Fe 16

Saxony

Wea. WED. MARCH 26, 1902 Ther.

Winkeerite

As 11 Cu 12 Co 39%

Ni 2½ Fe 2 Calcite 5

Si 2½ [illegible] 14 Etc

Thulite comes from [illegible] of Cal. [illegible] Bohemia

Found at Pria [illegible]

Motril in Spain

Wea. THURSDAY 27 Ther.

Unfortunite

As 21 Sb 3, Ag 59

Co 4 [illegible] 1% Ni 2

Fe 3 Zn 2

[illegible] Sweden

Wea. FRI. MARCH 28, 1902 Ther.

Sunshine in Colorado
Annual Report (3)
XXIII 380
Sterling Mining Co
Gunnison Co Colorado
Property adjoining
Minnie, Sunshine in
Gold Quartz of quartz
Prominent in Gunnison County Co
Mineral belt in vein
working in alluvial
Sulphide large quantity
Wea. SATURDAY 29 Ther.
Decomposed No Sulfa
two No Smelting
Contains 11 to 15% Co
Has Gus + other mines
near Silver Cliff
Colorado Contains a
number of valuable for
minerals & small
amount Co

Wea. SUN. MARCH 30, 1902 Ther.

Working Wad - Eng Pat
4486 June 1882 Julchem
Industry p 236
Wad fine ground
intimately mix 80 pts ore w/
20 pts Sulph. Soda
Roast - add sufficient
H_2SO_4 to convert remain
of the sulphide to
Bisulfate - Dry + fuse
in a furnace
Wea. MONDAY 31 Ther.
H_2O + SO4 driven off
The Lime NaCl or Bauxite
fine powder add
to neutralize the acid
Mass finished be ready
then broken up + cooled
Soak out with hot H_2O
to clean Sal add Na Sulfide
Set to precip Co Ni &
small amount Mn
filter

Wea. TUES. APRIL 1, 1902 Ther.

[illegible] Cone to save
[illegible] Sodo which
Crystals and [illegible]
Drop [illegible] [illegible]
[illegible] heated in
[illegible] to
obtain [illegible]
Mn

[illegible]

Wea. WEDNESDAY 2 Ther.

Calf all [illegible]

Leg Bertram Blount
book [illegible]
Examiners
p 31952962-1-97

Wea. THUR. APRIL 3, 1902 Ther.

[illegible]

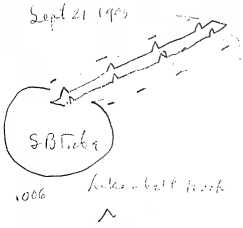
As our [illegible]
[illegible]
[illegible]
[illegible]
[illegible]

In Chili most [illegible]
[illegible] for Co

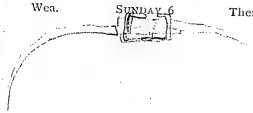
Wea. FRIDAY 4 Ther.

Veta Blanca of
San Juan [illegible]
also of Tram [illegible]

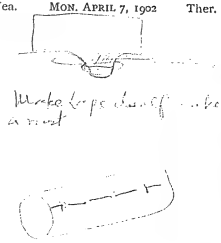
Wea. SAT. APRIL 5, 1902 Ther.



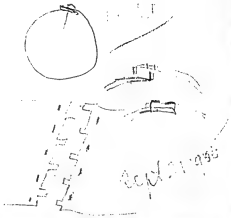
Wea. SUNDAY 6 Ther.



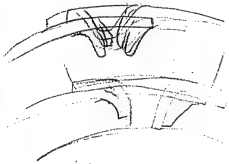
Wea. MON. APRIL 7, 1902 Ther.



Wea. TUESDAY 8 Ther.

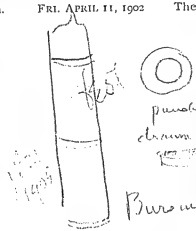


Wea. WED. APRIL 9, 1902 Ther.



Wea. THURSDAY 10 Ther.

Wea. FRI. APRIL 11, 1902 Ther.



Wea. SATURDAY 12 Ther.

Wea. SUN. APRIL 13, 1902 Ther.

Mixhaelis st.

Diff 21 14°

Wea. MONDAY 14 Ther.

See Hammarsten
Vol 2 p 230 first
2nd Column p 540
about Glycosuria
Tubercuilis -
Phosphorus determining test
opinion -

Wea. TUES. APRIL 15, 1902 Ther.

See Johnson Lecture
Bad Kreuznach Gastritis
Hence Hence

Try curing Glucose
Old glucose in urine &
maybe are something
but I take to mind it
by adding of KCA,
also fare a viscous

Wea. WEDNESDAY 16 Ther.

Cobalt Ni or other
Salt that will
take place glucose

Make the different
Sera for trial
with Dry Albumenate
in Oxford

Wea. Oct 1 1905 THUR. APRIL 17, 1902 Ther.

2 to 4 [illegible]
[illegible] that H_2SO_4
[illegible] plan
Prepaid [illegible] —

Have one chemist
work on increasing
Dehydration of Lyph

Wea. Oct 1 FRIDAY 18 Ther.

KP [illegible]
Concentrate [illegible]
also [illegible]

Size thru 30 all from
screen flake thru 15 + then
sure keep it off mesh
so that goes with on 40
+ 20 on — then mix in
proper proportion for tube

Wea. Oct 1 1905 SAT. APRIL 19, 1902 Ther.

see John Oil about head machine
for making [illegible] tubes for
[illegible] packing moved
burn inside —

Prepare [illegible] tubes for Deposit
with Arsenic, Aluminum,
KI Copper, Pb Zn
Sn Phosphate, Chloride,
Bromide, Nitrates,
Iodides, Humic, Sb,

Wea. SUNDAY 20 Ther.

See how thick that bottle
of Very bright Mercury [illegible]
of 0.0012 or thereabouts
mercury come good tubes
were bound or rings or
glycerine bars inside
50 Double T

[illegible] from Holland all
Lalande Cursons for
New Man & supply
plates cells etc

Let [illegible] [illegible] of other
Zinc distillers for powder

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
perhaps so light so just as
cheap —

see if HgFeK [illegible]
recovery Cu plate [illegible]
Ca HgFe [illegible] soak

[illegible] Holland [illegible]
Starling 150 [illegible]

June — Start [illegible]
Regard single [illegible]

Equipment falling [illegible]
Pt Cut in two by
Various ways — Ben
test one [illegible] —

Deleter Pt —
F Field — Chem News
43 — p75 add KI
— slight excess to Pt Chl
Pt Iodide dis — + if sol Conc
and liquid almost black
produced —
1 pt in 2 million detected
Col dissolved by H_2SO_4
Sulphites Thiosulphate Pla
Sulphurous a
Mercuric Chl [illegible]

Prangenes
[illegible] [illegible] and is heated
1/10 to 1/100 Pt. to [illegible]
Zinc + Pt — [illegible] [illegible] [illegible]
+ Pt — Cd + Pt. Mn + Pt
Co + Pt Pb + Pt Cu + Pt
Hg + Pt Au + Ag + Pt —

Wea. FRI. APRIL 25, 1902 Ther.

~~Intermediate~~ Cut a tube
so 1/2 of mix tube is
exposed then run it see
if mix tube opens to press
Prick holes in one tube
see if runs better —

get platinum needle
take out a tube of mix
lay on foil + use
needle see if not work

Wea. SATURDAY 26 Ther.

continue —

Take 2 ob group tube
discards tube
[illegible]
~~test~~ test M' tub
in glucose + [illegible]
to [illegible] —
then try run —

Wea. SUN. APRIL 27, 1902 Ther.

[illegible]
put in [illegible]

Nitrate K
Sulphite K
Bisulphate K
Bicarbonate
Hypophosphite
Hypophosphate
Nitrite
Cyanide K
Chloride [illegible]

Wea. MONDAY 28 Ther.

Tartrate
Manganate
Iodate K
Iodide K
Sulfate K
Sulphite Not
Thiosulphate
Oxalate K [illegible]
Acid Oxalate
Chlorate,

Wea. TUES. APRIL 29, 1902 Ther.

[illegible]

Wea. WEDNESDAY. 30 Ther.

[illegible]

Wea. THUR. MAY 1, 1902 Ther.

[illegible]

Wea. FRIDAY 2 Ther.

[illegible]

Wea. SAT. MAY 3, 1902 Ther.

500
500
500000
27) 14000
12500
1500
74

5500
5500
550000 (1
500
500
500

Harrison Jew

Wea. SUNDAY 4 Ther.

20000

Wea. MON. MAY 5, 1902 Ther.

Nov 24th -
Ferric Sulphate dissolves
Cupric Sulphate, forming
Ferrous Sulphate + Sulphate
Copper -
Auto [illegible]
[illegible]
[illegible]

Nickel or Cu dissolves
in Cupric Sul Mg Chloride

Cobalt found in Cobl
Mg [illegible]

Wea. TUESDAY 6 Ther.

CuS dis by Metallic Iron
Hot -
dilute Ferric Sulphate
Sulphide Copper
attacks Copper
Young reduced to
Cuprous Sulphide
+ air oxygen [illegible]
to Cupric Sulphate

Wea. WED. MAY 7, 1902 Ther.

Ferric Sulphate dissolves metallic Copper

Dip 3 tubes dissolve 650 length in Cone & Ni Alloy ~~[illegible]~~ peroxide — on theory that Ni has dissolved out Cu & coated with flake Co

Wea. THURSDAY 8 Ther.

Take some of the new Co flake from Copper & Coloring & make 3 cells coated 3 Hot each strip in 21% KOH, Run Cell 1 hot Flake the same in sequence — Test 4th make three —

Wea. FRI. MAY 9, 1902 Ther.

Dr to test for Cyanide in our KOH, new & old Solution,

test an iron or iron that Green in Hot test with Co flake & see if any Co on it or wanders down the mind,

Try 3 cells with sheet Co hot test with

Wea. SATURDAY 10 Ther.

25 mlg KCy in KOH, put up Keg cups filled with Co flake from big drum punchings & KCy make about 15 & try hot 3 each in KOH made different way

Wea. SUN. MAY 11, 1902 Ther.

Wilson not new flake
Lord dark green 1 lamp
Non d rub of flake 1
[illegible] 75
Scotchman's warm
color [illegible]

also reduce Glucose
down to the general
amounts like used
in No 243.

Wea. MONDAY 12 Ther.

group 5 up soaking
wet glucose fand
alkalum - then
soak 45 hours
33% KOH. 6 gps
chg

Wea. TUES. MAY 13, 1902 Ther.

put up 3 glass cells
continuity - carrots of
Co flake with
Chl K in KOH.
ditto IK - Sb_2O_3 or Sulfuric 25
25 mlg to 100 cc KOH

think that increase in
yellow on Rubber in
cells that went
bad was sulphur

Wea. WEDNESDAY 14 Ther.

also with KB in
autumn

dis of oz wet green
from 2 of 6 and in
group 1 that
is still good in
group 6 see slab
of flake - Saw
that first -

Wea. THUR. MAY 15, 1902 Ther.

Try Nebular with KOH
with Co film sheet

lest the load (1c)

Pulsars from
Pleiadowski nuc
near cross see of
Selenium & Cadmet
& Ag

Wea. FRIDAY 16 Ther.

May be Chromatic
Se 27 Pb 68 - Co 3.4

Wurtz about 5/8
1/2 mica diaphram
Hardt & Hammer try
2 Cu O plates 1 gm
Dry 21 Lebanon
see what V & Cu

Wea. SAT. MAY 17, 1902 Ther.

if good results try more
surfaces

See if there really is
any Mn or Co in
KOH after 6 gm running
30 Hours accumulate
until slightly red
to decrease and K Cy boil
& then precipitate by K OH.
also try Nitry

Bottling Dr may more

Wea. SUNDAY 18 Ther.

Co assaying and
McCreath let Dr
assay the Gum nubbs
+ Roth,

Dully to distill
Smalkite with
charcoal in
Earthen retort

Wen. MON. MAY 19, 1902 Ther.

Stock come Brad green
of fresh wash in strong
NaCl2. dry nitr [illegible]
[illegible] - [illegible]
Stock phos soda or K
Then pre caps Phos Na or Potash
parts, then of Chrome
[illegible] soak
out very weak KOH,
then put in 10% 5%
bring to work K cleaning
O Xalate or phos reduce
the sil prominence -

Wen. TUESDAY 20 Ther.

Stamp to be changed
Long change not allowed
reset 24 hours +
[illegible] 1/2 change
[illegible] Ulcer
1st change [illegible]
do with subsequent
life + capacity

Wen. WED. MAY 21, 1902 Ther.

Another stamp.
Reverse [illegible] [illegible]
then chg Reg -

Another stamp to be
used with bald iron
that have already
been long on first [illegible]

All new stamps to
have good CP rubber

Wen. THURSDAY 22 Ther.

Stamp of 3 with 100 Mlg
following
Antimonate of potash
Metabor ✓
Chromate ✓
Bromide
Reg ✓
[illegible]
Arsenate
Arsenite
Phosphate ✓

Wea. FRI. MAY 23, 1902 Ther.

Hypophosphite
Phosphate,
Borate
Ammonia –
Kl
Lead Ox
Barium hyposop
Lime
[illegible]

Wea. SATURDAY 24 Ther.

Zincate
Copper
hypochlorite K

Perhaps phosphorus
as phosphate in bad
in Call in fulmo

Wea. SUN. MAY 25, 1902 Ther.

Schmatol says that if
Cu anode Calcium
Considerable amount of
Tin the copper contains
Malleable & smooth

Arsenic dissolves in acid
or neutral solution as
Arsenious acid
Ag [illegible] as solution sodium salt
its known down as Arsenite

Wea. MONDAY 26 Ther.

from neutral sol arsenic
is deposited at Cathode
as metal from acid sol
only when sol is poor in
Copper

If arsenic exists in the anode
as Arsenite goes entirely into
slimes but in acid sol
its gradually disappears
as Arsenic acid in
Consequence of secondary
Reactions

Wea. TUES. MAY 27, 1902 Ther.

Deposition Voltage of arsenic is near copper + it can be plated out in a spongy state when the current density Exceeds 33.5 amp per square yard in Sulphuric Solution 125 milamp per inch

Arsenic can be precip by Steam of air + ammonia Acid of ferrous Sulphate the Arsenic combines to form ferric arsenate.

Wea. WEDNESDAY 28 Ther.

Arsenic acid, ruby As_2O_5

Arsenious As_2O_3

Arsenious ox dis in KOH but dont neutralize it.

Sec Salt decomp'd by CO_2 of air –

Wea. THUR. MAY 29, 1902 Ther.

when KOH saturated it gives crystals upon cool

K arsenite
neutral salt
$K_2O\ As_2O_3$
acid salt
$K_2O\ 2As_2O_3\ 2H_2O$

Wea. FRIDAY 30 Ther.

Arsenious acid sol
1 to 10 H_2O Hot
1 to 30 " Cold

Wea. SAT. MAY 31, 1902 Ther.

Think Can Roast Dearby + melt + pour to anode put in KOH strong with Nickel Cathode + form Arsenite K or deposit Arsenic on Cathode at low density without any Hydrogen

Wea. SUN. JUNE 1 Ther.

Also try KCl. Solution for breaking Wad

Try Bisulphite of Lime its Soluble

Wea. MON. JUNE 2, 1902 Ther.

test Warren flake for arsenic,

Weigh out some Dearby on ~~Roasted wet deposit~~ ~~in HOH~~ Roast it thoroughly + see how much it loses. – in small 1½" Porcelain

Have Fred Old fix the film cells so switch can run all night.

Wea. TUESDAY 3 Ther.

Try to find Warren 1000 – William just before Christmas 150 + Tom 100

Fred Old ~~make~~ get piece Warren anode 60 C 40 Ni + start mem. plating on the Co – Fred to cut out + polish small anode –

Wea. WED. JUNE 4, 1902 Ther.

Scheme Co oxalate very much
[illegible] than Mn & phosphate the [illegible]
[illegible] - [illegible] since 208

Wash Barley & [illegible] gravel
in small beaker & long time
on sand at low temp until
all the Co oxalate removing
the Mn are remainder
dissolves and the Co O by
NH_4OH [illegible]

For washing Barley dead

Wea. THURSDAY 5 Ther.

Treat with Barley water
to dissolve any arsenic
acid left by washing
Test the water see if it
really has arsenic -

Boil to use NH_4OH,
or better still [illegible]
[illegible] by H_2O
[illegible] H_2O,
after [illegible] O_4 H_2SO_4

Wea. FRI. JUNE 6, 1902 Ther.

perhaps of Barley 200 in
reduced to 1/3, arsenic
Hot Hypo might oxalate Co more
& they Hypo would not
would reduce Mn. of SO_4
[illegible]

If [illegible] chlorides the Co
be precip by Carb Soda or
precip with [illegible] & then
suspended in water or
Chlorine passed the sol
then filtered the [illegible] will contain
the [illegible] of the [illegible]

Wea. SATURDAY 7 Ther.

Possibly the Co Chloride precip
by KOH chlorine $KClO_3$
Heat more Co than Mn be precip
according to amount $KClO_3$
in the KOH.

Especially if the chlorine treated
H_2O_2 to peroxide the Co,
or acetate the Co &
peroxidize by H_2O_2 or
precip by Hypo. Contains $KClO_3$

Wea. SUN. JUNE 8, 1902 Ther.

New Zeln Soap Nos & Co
Mixtle K Na Sulphates & K2SO4
have different solubilities.
Operator thus, make
strong solution of Na4 Co
Sulphate, (C) Density.
While hot pour in
Concentrated hot so
of Sulphate K, Stir
Allow let the Crystals
separate then filter
The Na K Sulphates Salt
will come down as
it is 3 times less sol.
This is better solution
than using hydrochloric
to Sep —
Re Sums + Concentrate the
Density + remove Fe
ferrate or reduce any
iron present by passing
H2S although iron

Wea. MONDAY 9 Ther.

Wea. TUES. JUNE 10, 1902 Ther.

will come down with the
Sulphates
Look in Salts & Sum + see
of Na Sulphate annal Gallon
Gr 66 Sep together, where
the separation Co + Bis by
this process —
Perhaps by adding
proper quantity of K Sulph
Salt will act such
the volume of separation
Wea. WEDNESDAY 11 Ther.
Can take place —
of proper solution may leave
+ Cool after such
solution —
Fractional Crystallization
by putting in Excess a
in the Sulphate of Na4 Co
Solution - Cold also
cooling —

Wea. THUR. JUNE 12, 1902 Ther.

The Oxalic process may be just the thing as it eliminates sulphuric — the reaction is slow

[illegible] chance for molecular arrangement or

Possibly it should be done in dilute

probably Cold or Heat.

Wea. FRIDAY 13 Ther.

Would get all the H_2SO_4 back — only lose the Oxalate,

Ammoniacal H_2O_2

Oxalate of lime

Cu Sulphide —

Wea. SAT. JUNE 14, 1902 Ther.

Crookes Says Sulphide of Cu is sol in Ammonia

S S

1 1

This is good

Copper immersed in Cupric Sulphate solution (1/2) with Ammonia, The Copper dissolves until all of the Cupric Sulphate is removed to Cuprous Sulphate — The solution should be diluted with deaerated water & Closed up —

Wea. SUNDAY 15 Ther.

Key reserves CuS as Sulphide, hence it may be possible to regenerate the filling

Wea. MON. JUNE 16, 1902 Ther.

NH4S + KS + Thermo

Try in flake Nozzle H_2SO_4
slightly warm + blow
and thoroughly -

also H_2O_2 + blow air thru

in using K Sulphate to
work Dry - add
the proper amount H_2SO_4
to solution + Temp
down etc - as well.

Wea. TUESDAY 17 Ther.

as using Conc ~~solution~~
Solution

Boil a Copper oxide
plate in Conc KOH,

also in Melted
KOH, makes a
higher oxide

also Na or K chlorides

Wea. WED. JUNE 18, 1902 Ther.

Try in Solvents
Rosin - Stearic -

Solvents Try as
Electrolytes

2 pts Ca CP $6H_2O$
into which 3 pts.
Lime hydrox dissolves
the ZnO Combines

Wea. THURSDAY 19 Ther.

with $CaOH_2$
falls to bottom -

~~sl~~

Try Sulphocyanide of K - also of chloride of Copper - or Sulfocy

Nitrate

The precip Copper and by Barium Sulphide - p 8, Chem Engineering Vol 1 -

See if this water also Copper by Sulphocyanide of K - if it also reduces.

Throw down Cu as Sulphide by H_2S - & recover the Sulfocy

also try precipitate from KCl_2 Cu(Cl) the Copper by H_2S.

acidulate the KCl_2CuCl_2 with H_3PO_4 - also with the HCl in KOH, then while solution very acid & KCl_2 dissolved just H_2S. - This should throw down CuS & the H of H_2S forms with the Cl HCl which has absorbed

by the KOH.

Roast the CuS to oxide & use in Lelande

Wea. TUES. JUNE 24, 1902 Ther.

Dep Co fm Ni by [illegible] and deg of oxidizing by [illegible] sulphides —
Nickel fe oxdz most [illegible]
Mn Nest = Co Cu Zn
oxdzs very little —
Mount [illegible] Ni & fe
is pressed together by [illegible]
fumes then poisoned
Rise temp 45 deg C
Steam — p 199

No 34 1878 – Chem Sd

Wea. WEDNESDAY 25 Ther.

Scheme Dep by Ammonia
of Co & Ni & other organ
Sol one side Chl Pos
of Co Ni other side
also NaOH 1 side
Coll sol other side
NaOH can be replaced
by other chemicals

Wea. THUR. JUNE 26, 1902 Ther.

If Co Bloom is dissolved by NaOH, then we can roast Dudley by 1st driving off all the ammonia then washing NaOH & Continuing the roast & leaching —

Phos Ni is completely sol in acetic ac while phos fe is insol, when there is an excess of the phosphate

No 34 1878 Chem Sd
p 244 245 –

Dysprosium Kitto –
proceedings in that problem
of fumes non condensing
in Combs with a settling
chamber, the first
[illegible] to fumes
into a settling
Chamber,

Wea. SAT. JUNE 28, 1902 Ther.

[illegible] 2 or 3 weeks
[illegible] with Chloroform [illegible]
while heat, all [illegible]
off as [illegible] —
or Roast as [illegible] possible
then [illegible] with Chloroform
and heat or bathe [illegible]
CO_2 all [illegible] [illegible]
in Metallic

then
Wash out 2 or 3 weeks Dark
[illegible] with Salt 2 or 3 weeks
in air — [illegible]

Wea. SUNDAY 29 Ther.

Reach Medicine —

Absente = Absinthe
use of alcohol

free from Collom
with HCl [illegible] of
As all [illegible]

Wea. MON. JUNE 30, 1902 Ther.

Where HCl is principle
object instead of 2 NaCl 1 [illegible]
in [illegible] HCl is [illegible]
then the HCl is not [illegible]
with Sulphuric

In HCl condensing Tanks
Sandstone is used
[illegible] is best [illegible]
[illegible] of dense [illegible]
not necessary

Wea. TUES. JULY 1 Ther.

in debate but HCl will
replace Sulphuric from
Na Sulphate, in proportion
of 2 NaCl to 1 Na_2SO_4
only in Conc condition
with H_2SO_4 drop [illegible]
HCl from NaCl.

Wea. WED. JULY 2, 1902 Ther.

The Aussig Chemical
Works supply stone ware
in Gardenway - copy go
Mail to Germany [illegible]
Works
(Where is Aussig works
Situated?)
Aussig Austria

Wea. THURSDAY 3 Ther.

Write Bab Spice
about getting me some
Experiments —

Immense throng down
by people Walk from
Salt whole not

Wea. FRI. JULY 4, 1902 Ther.

1 = Write Bergmann to get all the Catalogues, price lists Aussig Chem Wks Aussig Austria Chemical Gallenkamp Hydrochloric acid Carbonic acid etc

2 = Write Bab spice Pratt Instruments get bought young man —

3 = Hurry flour & measuring apparatus platinum bldg

4 = About getting Crucibles for platinum

5 get Catalogue and Spent Elec & other windows Electric furnaces —
Wolfram for organic

6 = get Brasch's limit Burettes for Cement,

7 Fred off for muffle for furnace — run pipe out doors & [illegible]

Wea. SATURDAY 5 Ther.

8 = Record Determinations Sunday + get a supply of those that work

9 = Scheme out apparatus for KCl recovery

10 " " for dissolving Cu on platinum KCl

11 " Washing & Drying —

12 = Wood for drying, drawing for it & Top,

13 = find out from Abbot first address of family making Chem pots in Phila —

14 = Hooker find photos of power houses at Edison — drawings there at Silver Lake

15 = find out of Blake Crusher for fine Grinding

16 Miller find out about Wheaton burners

Wea. SUN. JULY 6, 1902. Ther.

17 Buy gut machine [illegible]

18 go over see Wed'sday [illegible] not Wednesday

19 Look in big dressing for makers Sales and To get chain to Washburn [illegible]

20 See dentist [illegible] Drum [illegible] heavy

21 Cambry make 2 lbs of [illegible] chain

22 get boy Kly from Kleystum — [illegible] of Kly — [illegible]

23 Find old gut 200 lbs see Dry Cobalt [illegible] — Cambry [illegible] [illegible]

24 See if the good rubber hose [illegible] for [illegible]

25 Holland St. 5 & 6 Nashville [illegible]

26 Buy [illegible] Kly [illegible] [illegible] [illegible]

27 New rolls bearing chain — also [illegible] — Cambry [illegible] [illegible]

28 Repair [illegible] Kly from Cuyahoga [illegible]

29 Bring [illegible] [illegible] [illegible] [illegible] [illegible]

30 [illegible] Kly can be [illegible]

31 [illegible] [illegible] [illegible]

Wea. TUES. JULY 8, 1902 Ther.

32 - [illegible] and [illegible] from [illegible] by [illegible] [illegible] KOH to Lake Court of the City of S The Cr [illegible]

If the [illegible] work [illegible] [illegible] of [illegible] [illegible] which is the [illegible] [illegible] with Kly —

[illegible] 1 lb [illegible]

[illegible] 1600

Wea. WEDNESDAY 9 Ther.

10 X 10 X 12 —

[illegible] 65. [illegible]

[illegible] 65 complete no hose —

Sulc 65° Bann [illegible] Dry Co

45 with per lb - delivered

Wea. THUR. JULY 10, 1902 Ther.

Present Hemoglobin C [illegible]
of [illegible]

[illegible] Wash at
Middleton is -
also the Wash by [illegible]
Sulphate, filter, precip
the NH4Cl by Na Sulphide
only little then comes
down - wash precip
press there filter press
then treat with perchl [illegible]
worst men goes into sol

Wea. FRIDAY 11 Ther.

prussic as S. [illegible] + prussic
as chloride, heavy
compound [illegible] spectrum
pure residue of NH4Cl
Sulphides by Hand
New S Works Rep[illegible]

p. 232

Wea. SAT. JULY 12, 1902 Ther.

Tried oil to make a paint
brush robin inch or so
dia one roll 90 30
the other 5 cy 50

to [illegible] the single

[illegible] K in the [illegible]
ion $Ag(CN)_2$ the [illegible]
in the K acts [illegible]
in the $AgCN_2$ + deposits

Wea. SUNDAY 13 Ther.

Silver

[illegible] at red heat
reduces Cyanate to
Cyanide de K -

[illegible] Kly +
some Cyanate [illegible]
[illegible]
+ Cly

Wea. MON. JULY 14, 1902 Ther.

Perhaps can use iron
anode in the Cu Kay Sol
instead of the Copper
[illegible] Blue
get the Key book
on regulating the blue with
Chemo Potash
[illegible] Iron Cyanide &
KCy –

also rubber rolls
30 Raw + 50 - Red

Wea. TUESDAY 15 Ther.

Soft rolls –

If the two new long brushes
work then make a gang

Wea. WED. JULY 16, 1902 Ther.

Try some Sulphate Iron
mixed with Cake Wheat
Dump to alloy then
precip by Caustic Kott
to form a Dark brush
probably Cold Mg Boiling
[illegible] Potash solution

probably the least crawling
brush would be a
wounded soft rubber
with fine Teeth 1/32 long

Wea. THURSDAY 17 Ther.

Wea. FRI. JULY 18, 1902 Ther.

Very Conc Hemosulphuric K
attacks the [illegible]
[illegible] Cupric
Sulphide then decomposes
with Cuprous Sulphate
& Sulphur. Boil [illegible] forms
[illegible]
Cos + K Sulphate in the
Solution

The action is 1st formation
of KOH + Cuprous Sulphate

Wea. SATURDAY 19 Ther.

The latter as fast as formed
splits up into Cuprous
Sulphide which forms
the double Salt K_2SO_4
+ the Sulphuric acid
[illegible] of [illegible]

Chem Soc [illegible] 93

[illegible]

Wea. SUN. JULY 20, 1902 Ther.

Treat Cake with KS fully
then oxidize the Cu S by
Permang in alkali
also by Nitric Acid
to form a sulphate of
the Cu S ____

Cuprous Compounds
with Sodium Hyposulphite
form a double Salt
Solubility in H_2O

Wea. MONDAY 21 Ther.

[illegible]

[illegible] Chem Soc 54/C

Wen. TUES. JULY 22, 1902 Ther.

[illegible]

Wed. WEDNESDAY 23 Ther.

[illegible]

Wen. THUR. JULY 24, 1902 Ther.

[illegible]

Wen. FRIDAY 25 Ther.

[illegible]

Wea. SAT. JULY 26, 1902 Ther.

Calyfusion

To ½ of Gallery add
Arsenic ammonia
possibly in the wallas office
reduction —

also Pt Cl, to form a negative
metal in ½ so it will deposit
it without Gold coating in solution
so that on Cadmium Sulphide
it will be on the surface
quite higher Unitary —

Wea. SUNDAY 27 Ther.

Gallery — Mix some quicksilver
with the Coffee

Moved the cure on Split moved
take out & insert in Libra
burns outside so Cumbersome
Change towels also
Coat outside with
plastic paste

Wea. MON. JULY 28, 1902 Ther.

Add Chromic hydrate to
Lebanite - forms green
precip. with ZnO in KOH,

Fluoride In forms Double
Sal salt with Fluoride
of K,
Fluoride K in Lebanite
ought to work —

Try $ZnCl_2$ in Methyl
Cyanide — of Ethyl
also $CoCl_2$ in Methyl

Nigelum Sulphuron
acid + Sulphuric with
dilution Cu —
Make by passing of
H_2S through Sul Sulphuron
acid —

Wea. TUESDAY 29 Ther.

Wea. WED. JULY 30, 1902 Ther.

Stannic Fluoride
Iodine Fluoride K
Stannous Fluoride

Phosphotungstate of K

Phosphotungstate of Ag

Borotungstate

Hydroxy $CoCl_2$ in Alcohol
Zn
Cu

Wea. THURSDAY 31 Ther.

10 Chem pellets, 1 cc arsenic
Soak overnight, low temp
it changes & dissolves twice
by 2 drams only then put
in Fresh - I decided to dissolve
it good before it gets chance
to deposit arsenic because on
Heat it tube cracks —
Knowing Co Cl2 Hydroxy affinity
not wd good to use Dirty
due to other Arsenic

Wea. FRI. AUG. 1, 1902 Ther.

Cuprous Chloride dissolves in
NH4Cl or CaCl2 it acts as
Sulphide Copper thus
$CuCl_2 + CuS = Cu_2Cl_2 S$.
dissolving the CuS & liberating
Sulphur —

Cuprous Chl in NaCl
When evaporating arsenic
from Sb or Bi is thrown
down by CuO or Cupric
Lime — I oppose it.
Cuprous Chloride in NaCl sol
that is not —

Wea. SATURDAY 2nd — Ther.

Hydroxy Dirty treated wrong
with hot change in Electric
furnace —
then Electrolyze 1 cc of arsenic
left in Hydroxy

Reduce Dirty in water
as by Hydrogen —
redissolved by 10 cc
arsenic left behind

Wea. SUN. AUG. 3, 1902 Ther.

Cu only half (acid) is reduced by Cu to Cuprous in [illegible]

Dissolve Barby ore by Sol in [illegible] & [illegible] filt the Co Ni get rid arsenic – Try Chlorate

[illegible] dis in HCl ~~and~~ reduce any arsenic A To Manitis Dry + dissolve in Ethyl [illegible] with al –

[illegible] Solution of Sol Cu

Wea. MONDAY 4 Ther.

is crystals then mother liquor ~~[illegible]~~ ~~[illegible]~~ ~~[illegible]~~ then mother liquor

boiled + Cu & arsenic

Hiron down – bal left as Sol acid ± the mix of Blue Vit is dis in hot mineral water & ~~[illegible]~~ V Sol dis & leaves Carson acid –

Wea. TUES. AUG. 5, 1902 Ther.

Wike says best way get rid arsenic is to deposit it a low density ore is [illegible] about (Copper) Vulcanite same at Manufactd Copper Solution Contains Ni Co & As – The arsenic is deposited along with Copper [illegible] density 7.5 sec do 3.3.5 any fear 5 gp opens

The Sulphides of Co Ni & c are crystallized out + acid key [illegible] used over again –

Get Borcher's Ref [illegible]

Borcher removes arsenic + iron from the Manufactd Copper dr by blowing air in fume & form ferr sulp As & Fe in acid solution Ferric Arsenate

Wea. WEDNESDAY 6 Ther.

Wea. THUR. AUG. 7, 1902 Ther.

B+Sb are thrown out after boil when t becomes less acid

Try ammonium Cu Cl flake - Na w Hg

Dissolve Barby with Sny add NaCl - ~~w/s then get~~ ~~Cl's NaCl Crystals~~ Crystals the KClplatinate out

Darby dissolve K_2SO_4 add NaCl - Then

Wea. FRIDAY 8 Ther.

Tremolite ore with Chlorides, without necessity of HCl. The sulphates will not bother in precipitating Carbd probably

Crystallize most of Sulphates out w/ Force the Chlorides so as to separate them easily

Wea. SAT. AUG. 9, 1902 Ther.

If this bond go then use Bisulphite & Sulfur ore Regenerate the NaSulphate should need to make it Bisulphate again

Force roasted Darby with Wood Carb Soda. This will get rid of the arsenic & Arsenate Soda leach out, also Try ~~NaO~~, NaOH,

also $Ca + NaOH$,

Wea. SUNDAY 10 Ther.

also NaCl,

Boil Darby roast with Hypo NaS for long time Extract Thio Sulph H_2O base or leave + Class on HCl, Evap dry dis with H_2O & test for arsenic -

Wea. MON. AUG. 11, 1902 Ther.

Barly treated ore fuse
with Chlorate. K + KOH,
Extract water. This should
remove arsenic.

also Try Barly roasted
fused which is not chlorate.
Extract H_2O -

Hypo sulphite Soda this
Ag & Cu fuse but also quite
Try this & only tried it
on CuS -

Wea. TUESDAY 12 Ther.

The Thiosulphate Copper
Can then be precipitated
Na Sulphide. Not for
Regenerate the
Thiosulphate of Na
Solvent sodium dried
from alcohol Dr Metz - Sodi

Wea. WED. AUG. 13, 1902 Ther.

Antimony & Arsenic Silver
Compounds quite cap their
Silver to Thiosulphate Na

20 grms Litre dissolve at 54.C
about 100 mils of Silver
Copper about same but sol
Can be antimony gives Sb_2O_3
& Cu precip but K_2S &
Thio requirements -

Wea. THURSDAY 14 Ther.

Our trouble with plating Zn
is probably due to Arsenic
Schmable p 916 917: continuing
filtering the electrolyte removes
Zinc shavings
Soap to prevent spongy
deposit of Zinc must
have Sol free of Cu As Fe
Try this - also make some.
Electrolyte Zinc thio
way to use it as moulds

Wea. FRI. AUG. 15, 1902 Ther.

purifying the ~~Zinc~~ Sulphate
Zn by filtering thro
Zn shavings

Showed by ZnOX at bottom
& Top shavings best,
The OX Zn which precip
ferrous sulphate.
Solution leader becomes
basic from standing up Zn OX.

Has stop when Electrolyte
purified thus way & as kept

Wea. SATURDAY 16 Ther.

Circulating during Electrolysis
when Electrolysis is carried
out at temp of 150 to 200°C
with density of 5 amp per
square yard the chance
of spong Zinc is completely
obviated. Density of
Electrolyte 1.4 to 1.6
B—

Wea. SUN. AUG. 17, 1902 Ther.

It looks as if MgCl₂-Electrolyte
& KOH with Silicate of K &
Zinc Electrode say Mg
& CP Zinc might be made to
work often all as the K Silicate
increases the solubility of Zinc
much — Arsenic Cu & Fe
Can be got rid of by the Zinc
Shavings process & several
times depositing the Zinc
or purifying the Sulphate
by Zn Shavings & depositing
off out 2 or 3 times &

Wea. MONDAY 18 Ther.

using thus Zinc for
electroplating —

Forming K₂ Zn(Cl₂)₄ OH
increases solubility of Zinc
Try it on the Zinc Baker

Wea. TUES. AUG. 19, 1902 Ther.

If use Zn. + have to have
acid Sol of Co Sulphate.
Either use Boric acid for
reducing it acid) Try
Boric + Citric, these acids
probably not ~~act~~ dis the Zn
+ form the Co Solution —
or with Fe as well — Fe will
not reduce the Co, anyway
Nitric will Zn to any Solution
if Sol Cobl. — of Course if
Wea. WEDNESDAY 20 Ther.
will oxidize some + time
would dissolve in the Sulphur
acid used to keep Co solution
acid but Boric acid
would form an insoluble Zn Borate
+ probably keep it out of
solution —
Make an experiment with
Dipped Zn + dip it
in ~~[illegible]~~ some of our
plating Sol see if it
deposits Co —

Wea. THUR. AUG. 21, 1902 Ther.

Also — neutralize the Co by
Nitrate or Kott. Then
add Boric also or
another Sol by Citric
+ see if it reduces Co
then —

Try some Prussiate of Potash
(Yellow) mixed with powdered
Charcoal + brought up to
white heat in Platinum
forge to see if any more
arsenic can be distilled

Wea. FRIDAY 22 Ther.

aff — probably good deal
by reduced to metal Co Fe
+ make it Sol in H_2SO_4 —
Then by putting in NaCl
probably get to Chloride
+ then we get rid Cl of
HCl —

Wea. SAT. AUG. 23, 1902 Ther.

Hydro acid 10% solution should be semi-normal instead of 20% as now used —

For Lechanche use
Silicate of Ammonia
Then form Silico Zincate of Ammonia —
Try KOH, also.

Wea. SUNDAY 24 Ther.

Set up 5 Reg flat [illegible] in little cell 250 ohms hot cell,

Also NiOH + 10% Bismuth Hydrog made as to prevent precipitation

~~also~~

Wea. MON. AUG. 25, 1902 Ther.

January 7 1902 —
Try the new KSilicate 40 grams in 200 cc
21% KOH in Reg 11.7 Volts
Charge after plates

Arsenious acid is reduced by Copper.
Use SO_2 to reduce arsenic acid —

Nitric acid in a liquid with a small quantity prevents formation of the fumes which are made by Zinc. It forms the Solid hydrate giving a brown flake on the Zinc

Wea. WED. AUG. 27, 1902 Ther.

HCl sp. gr. 1.115 does remove to
filtrate while sp. gr. 1.100
does not as well

Stannous Chl strong
run HCl 1.115 - precips
all arsenic so it
cannot be decided by
Marsh appa.

$SnCl$ gives no precipitate
Reagent sp. gr. but only
when strongly HCl -

Wea. THURSDAY 28 Ther.

Possibly sulphurous
HCl - will convert
all remaining Arsenic
into Chloride

The Acid will prevent
the presence of HCl
with excess of HCl
it can be removed
and by HCl

Wea. FRI. AUG. 29, 1902 Ther.

figured without dissolving
the $CoCl_2 \cdot 2H_2O$
The whole dissolved in HCl
& brought up to 300 C
& then treated with
anhydrous Sulphurous
acid & phosphorous
in which the $CoCl_2$
is not soluble -
perhaps some of the
liquids organic
will dissolve out the
and leave the liquids
in which $CoCl_2 \cdot 2H_2O$
$NiCl_2$ is not so in
does not look

Wea. SATURDAY 30 Ther.

Wea. SUN. AUG. 31, 1902 Ther.

In dissolving Chloride
Concentrating the solution
drove very much
+ adding Sulphuric
need to neutralize
arsenic to arsenious
when Evaporating
down, or add Bicarb to
them. Upon the Sand was
we would be able
to dispense good

Wea. MON. SEPT. 1 Ther.

after Arsenious
Acid dissolved 1½%
Add in water

Wea. TUES. SEPT. 2, 1902 Ther.

Cold Alcohol only
dissolves 1.68 gr in 100
of 56% — 86% dissolves
0.715 — Absolute
dis 0.025 gr in 100,
above is for calculations
for the various arsenious %
56% Alcohol 0.5 gr
88% 0.171 gr
absolute 1.060 %

Wea. WEDNESDAY 3 Ther.

Arsenious Ox at ordinary
heat + Chlorine gas as
HCl by gradually moving
heat gas off in part
as HCl residue is
arsenic of arsenious
heated with Sulphur
ammonia gives
off AsCl + SNH3

Wea. THUR. SEPT. 4, 1902 Ther.

45—

41
19
4) 60
15

Wea. FRIDAY 5 Ther.

Wea. SAT. SEPT. 6, 1902 Ther.

176 | 746 | 4.2
704
420
420
80

9,75 25 50

150
600 905
195
25

Wea. SUNDAY 7 Ther.

45
8125
905
1767

423
995
2115
2961
3807
4124 25

Wea. MON. SEPT. 8, 1902 Ther.

Arsenic acid boiled
with strong HCl is
converted to the Chloride
at 135°
Perhaps by dissolving
Diarsenic trioxide +
using strong acid
The As got into Chloride
by [illegible] 1st
Mon good a solvent is

Wea. TUESDAY [illegible] Ther.

Does the Cl [illegible]
not the Cl [illegible]

Wea. WED. SEPT. 10, 1902 Ther.

Metal dissolves in
Arsenic acid
Stannous Chl precipitates
soluble precip of Stannic
Arsenite $2Sn_2As_2O_3$

Magnesium Ammonium Arsenate
Very little Sol in H_2O
Solubility insol in Ammonia
Sol - 2600 pts water at 15
15800 Nitry to 3 of water
846 - Conc Sol of Sal Ammoniac

Wea. THURSDAY 11 Ther.

1315 Dilute Sol

Possibly by using Mg
could get out most of
Arsenic from chloroform
Roasted Herring
at red heat Loses Nitry
+ goes to Magnesium Arsenate
very stable at high
Temp

Wea. FRI. SEPT. 12, 1902 Ther.

$CoCl_2$ $4H_2O$ to BP 111° C
on sand bath in $CoCl_2$ $6H_2O$
heated to 116° $CoCl_2$ $4H_2O$
then [illegible] $CoCl_2$ $2H_2O$
at 121 [illegible]
Concentrated into the Zinc
Salt at 140° C it
[illegible] rotate into
water – its pale blue
& must not be heated
too as it quickly

Wea. SATURDAY 13 Ther.

absorbs water.
It goes to $6H_2O$ at once

Hazelhall and [illegible]
Explanation [illegible]
in Hydrochloric Solution.

Wea. SUN. SEPT. 14, 1902 Ther.

Ice [illegible] water a Grid
[illegible] deep
for new SB Bring
also [illegible]
[illegible]
Dragg

Wea. MONDAY 15 Ther.

Try Silicate KOH in
Leclanché – also
for Leclanché Dry cell –

Select a low tube from
good set & force ring [illegible]
it see if it comes OK –

Open up a wet tube
notice Plate Etc –

Wea. TUES. SEPT. 16, 1902 Ther.

Hurry up Chem Plant
for Darby –
also Rock plant for 004 stock,

Find out prices Hydrochloric
press to give same price
in 250 lots or over
price, find the relation

Test Zinc for flake plating
use of Zn reduces $CoCl_2$
[illegible] Zn [illegible]
Wea. WEDNESDAY 17 Ther.
potash the Zinc –

Write the Young people
Valparaiso Factoring
offer 15 to start

Wea. THUR. SEPT. 18, 1902 Ther.

Consider Lim Converts
Acetone into Mesityl
Oxide – dehydration of alc
remedy act of Acetone
Lim st into Condensation
products –

Mercuric oxide is not
in Acetone in presence
of KOH – our test
that bad with Acetone
wasn't the thing

Wea. FRIDAY 19 Ther.

Try Curio of Cake in
acetylene & Bombay
says Cooper gives
Cabot Brand with
Copper is recovered
of 0.006% acetylene

Write Malloy that asked
we can spend a [illegible]
to drink [illegible] to [illegible]

Wea. SAT. SEPT. 20, 1902 Ther.

Black porous chunks glass &c –
5000 milligms put in bottle for with Sponge –
End of

1 hour –	5003.5
5 "	5017
20 "	5030
29 "	5050
41	5081
47	5087

Wea. SUNDAY 21 Ther.

Dry 5 grms flake Co Test in pocket possibly an quickly from perox may be formed & it will run

---

Possibly No 08½
should have some Cobalt in to test as Cobalt gives off O. may be found –
No yellow has Co in it – E

Wea. MON. SEPT. 22, 1902 Ther.

What is wanted for Lalande is a hydroxide & not an anhydride of CuOxide to make the action &c –

[illegible] CuO_2 [illegible] $Na(H)_2$ which there no impurity –

Wea. TUESDAY 23 Ther.

[illegible]
[illegible] Sp. [illegible]
[illegible] from [illegible] [illegible]
[illegible] disable [illegible]
also [illegible]
Anode, No [illegible]
& put in [illegible]
No Silicate [illegible]
Current [illegible]
& Silicate [illegible]

Wea. WED. SEPT. 24, 1902 Ther.

[illegible]

Wea. THURSDAY 25 Ther.

Wea. FRI. SEPT. 26, 1902 Ther.

Filing 56 - 5 pts Tartaric Emetic
5 pts Tartaric acid dissolved in a
solution of 2 pts KOH in 50 [illegible]
H_2O [illegible]
Silvery grey color [illegible]
[illegible]
indicating the presence of antimony
SG 6.150

[illegible]
(in H2O?) [illegible]
black [illegible]

Wea. SATURDAY 27 Ther.

[illegible] fracture brought,
Rhubarbed or [illegible]
[illegible], great champ heading
from 60 to 450 [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

Wea. SUN. SEPT. 28, 1902 Ther.

Acid solution of [illegible]
Sb deposits [illegible]
Vigorously acid [illegible]
nothing [illegible]

[illegible] acid [illegible] acid
[illegible] Sb [illegible]
in HCl [illegible]
decomposition [illegible]

Trisulfide Sb dissolves
in ammonium sulphide

Wea. MONDAY 29 Ther.

KOH forms a precipitate of
trioxide Sb soluble
in excess
Carb K precipitates
Sb in excess but reappears
after a while —
If however the Sal Ammon
Tartaric Ac be present

Wea. TUES. SEPT. 30, 1902 Ther.

forms [illegible] soluble [illegible]
in excess of the KOH.

Tartrate of Sb with co
Tartaric Acid

Copper [illegible] Sb [illegible] and
Metallic Sb
dissolves by K permanganate

Sb trioxide [illegible] K_2O
without decomp.

Wea. WED. OCT. 1 Ther.

Trioxide Sb does not
in Acid Tartaric X

Antimonate of Lithia
Mix one Sol of LiCl with
X Antimonate dissolves
Evaporate [illegible]

Wea. THUR. OCT. 2, 1902 Ther.

[illegible]

[illegible] 1 pt Sb5
[illegible]
melt it [illegible]
12% Sb [illegible]
[illegible] of Sb
which deleposed [illegible]
profectly [illegible]

Sb5 solution.

Wea. FRIDAY 3 Ther.

Lowering [illegible]

Peroxide [illegible] Sb [illegible]
Easily [illegible]

Get 20 lbs Antimony

Try Cylinder wrapped [illegible]
with asbestos or clip on
V-groove of melted Sb to
chill a nicer) on inside —
Solder ends in —

Wea. SAT. OCT. 4, 1902 Ther.

Pulverize the Cylinder inside ↗
[illegible] it thick 3/16 — Cold

Use Copper drum [illegible]
film of antimony on it
from [illegible] SbH3 —

[illegible]
Sb in [illegible]
Pharmaceutical purposes
Sb is deposited on following
metals deposed in the Sol
Zn Bi Sn Pb Brass [illegible]

Wea. SUNDAY 5 Ther.

[illegible]
Copper [illegible]
Dis [illegible]
Warm dilute HCl —

Wea. MON. OCT. 6, 1902 Ther.

[illegible]

Wea. TUESDAY 7 Ther.

Weg 2 lbs H_2O 4 lbs H_2SO_4
8 lbs Tartrate of -
Sings this is the best of all
Sb plating sol — I believe
the Sb — or does he mean
to do Tartrate of Antimony
in it — I guess this is
what is meant,
bottle marked strong Sol

Wea. WED. OCT. 8, 1902 Ther.

Sugar coat for mold, ensure
along Cornice without bad
plating of Pen elephant 1/4"
thick

Coating Copper by simple
immersion
Dis 1 oz $SbCl_3$ in 1 pint
alcohol add SO_4 until
liquid clear. w/ 2 hour
Copper will come out Coat

Wea. THURSDAY 9 Ther.

Try Regmint on file Ni
SO_4 on Brass & Cobalt
plated Ni also Ni
+ Cobalt plate over that

Try thin plate of
Antimony over Copper
or sheet stock of it
well stand OH or KOH

Wea. FRI. OCT. 10, 1902 Ther.

Antimony Completely Valuable
at 130 cent

When 3 ccs of 26 Tri ox
is boiled with a sample
Sol of Tartaro emet
1 Mol of Potassium ox
Every 5 Mol of the acid precipitate
the process must not be
hurried, for Every 3 dry
5b2S3
~~5b2~~ Sol Na2S, mix with

Wea. SATURDAY 11 Ther.

NaCl to increase the electrolytic
conductivity. Cinnabar
deposit in powder or sheets
Sulfur — to much Na2S
not be wasted, in order
Rio —

Highly valuable
potassium antimonyl
fluoride —

Wea. SUN. OCT. 12, 1902 Ther.

Oxalate 5b4K 5O?

If Chlorin of a strength of
not more than 7 per
cent deposits goes to impure
26 — but additional 5b2S3
comes at 62 supposing

When a Sol of
Antimonious chl
is containing free
acid is expected to run

Wea. MONDAY 13. Ther.

at well above 0 °C
the more 5b —

Dissolve 5b2S3 sheet
in strong polysulfide
solution

Dangle fall
250 Vol 79 ce
Separating ore by Hot
HCl gas —

Wea. TUES. OCT. 14, 1902 Ther.

Hydrofluoric acid [illegible]
[illegible] the crystals as
amorphous [illegible]
[illegible] insoluble
[illegible] 50 [illegible] is not
decomp by water
[illegible] evap to crystals

[illegible]
St Francois Co

Wea. WEDNESDAY 15 Ther.

(Hallow) Reverse
one of the parcel
at the [illegible]
[illegible] of [illegible]

Try dipping drum
[illegible] each time
[illegible] of [illegible]
in Co in 30 sec

Wea. THUR. OCT. 16, 1902 Ther.

also in Cu [illegible]
also try. Chloride of
Cu — Acetate Cu
Formate Cu
Double Oxalate Cu
Trichloroacetate Cu

Mess up & down & take out
when [illegible] in [illegible]
of Cu —
also [illegible] chloride in
Cu

Wea. FRIDAY 17 Ther.

also pur of [illegible]
Iron —

Try Jarrah Cop
[illegible]

Ethyl Sulphide Cu
[illegible]

Try camphor oil in
[illegible] Sol

Wea. SAT. OCT. 18, 1902 Ther.

perhaps gas made by acted in Cu attacking the Co by Boric Etc.

Quite forgotten what has become of that large Cyl of high pressure phosphorus

Wea. ~~SUNDAY 19~~ Ther.

It may be that Ky combines with Nitrates & other unstable or something in the KOH Tests or from the Iron or the Steel in Combine with the or Co of Ferro & not being soluble in KOH after Combustion makes bad Contact

Wea. MON. OCT. 20, 1902 Ther.

Take up with Hayden Ele & CO (B&S) about going ahead with Steel Rolling plant bottom of Prop Nico Bldg —

Experiment Wood Distillation oil — Wax — Spirits Glycerine Etc Etc

Consolidated Mechanical Reduction Co. to treat the ores of the Smelting Co of Australia at Dapto New South Wales 1904

Wea. TUESDAY 21 Ther.

Report of Mechanical Co in Lehigh Co Idaho Co to ship one sample therefrom 1903 nothing in 1903

Wea. WED. OCT. 22, 1902 Ther.

Standard Gold Co mine
Grant Co Oregon

Si	47.86
S	4.43
Ca	20.15
Fe_2O_3	17.28
Al_2O_3	0.12
CuO	2.88
Co_2	1.94
Cobalt	6.34
Nickel	.75
Gold	0.017
Ag	0.0028

Wea. THURSDAY 23 Ther.

101-7495

Co is in form arsenide

Some Ni ores from development work on mines in Hemlock, Floyd Co Va & near Wisbeck Jackson Co NC

Wea. FRI. OCT. 24, 1902 Ther.

See arsenic works method
US Geol Rep 1903

US Arsenic Mines Co
now city Rewald Post office
Floyd Co Va Forsythe Gold Mine
distance & locality
wanted to get of
Write Commissioner
of Mining Revenue
Clarksville Va
Know anything about
The Sterling Mining Co
Mines Jackson Co

Wea. SATURDAY 25 Ther.

Co C

~~Also write to Commissioner~~
~~Utah, if he knows of~~
~~any available producing~~
~~Nickel Cobalt~~

Mn ores occur in
Bibb Co near Woodstock
also — in gneiss
at Stocks Mills Cherokee
Co also.

Georgia —
Cartersville District.
also Cave Springs Floyd Co
Dade mines Lookout
4½ miles NE of Trenton
Clay deposits
Fine quality of Iron
goods mfd — Rome Cartersville
also Etowah property
big deposits

Mn mining
Mecklenburg Co — near Warm
Springs & Continuous belt
of Mn ore 8 miles long
1 to 3 wide —
Light Blue Mn ore

also Caldwell Co,
5 miles west of Lenoir
also Parkins mine,
10 miles W of Lenoir
also 10 m north of
Dobson in Surry Co
NC
also 2 miles W of Blue
Ridge Gap — Watauga
Co — Seam 2 to 4" thick
Zinc

also in Nash Co
& Jackson Co.
Chatham Co
Series of beds of
Mn ore worked
with Kings Mt & Fales
in Gaston, Lincoln
& Catawba Co which are
superficially changed to Mn.

Wea. THUR. OCT. 30, 1902 Ther.

one naturally [illegible]
near old forge on
Crowders Creek
on W bank of Crowders
Mountain

S Carolina
Dorr [illegible] near
McCormick SC

Wea. FRIDAY 31 Ther.

Jenn
Hackman
also Green Co with [illegible]
at intervals at the foot
of the extreme Eastern Mountain
(Unakas) all the way
from Va to Ga

Wea. SAT. NOV. 1, 1902 Ther.

Thu found all down the
Chilhowee tilt range
here [illegible]
Six miles from Elizabethtown
Carter Co.

In the Triassic it [illegible]
near Clinton, Hunterdon
Co N.J. There [illegible]
[illegible]

Wea. SUNDAY 2 Ther.

[illegible] 47% Thu
7% [illegible] 25% [illegible]

[illegible]
in Morris Sublin

Coeff 0.65

also found — the
Triassic Trap.

Wea. MON. NOV. 3, 1902 Ther.

Arrived Co [illegible]
in Kalsey [illegible] at
Compton Los Angeles Co
Cal. [illegible]

in N. Carolina [illegible]
is from the Cherokee
Co [illegible]

Wea. WED. NOV. 5, 1902 Ther.

Wood's [illegible] Station
Calhoun Co [illegible]

Wea. TUESDAY 4 Ther.

S Carolina
Hard Labor Creek
& at Dorris Mine —

Etowah is in Bartow
Co Ga —

Wea. THURSDAY 6 Ther.

Wea. FRI. NOV. 7, 1902 Ther.

The Gem of the Mines
near Silver City
Colorado Contact
W. mountains +
Lincoln mountains

Co with Mr. Wheeler in
Grant Co Neville
near Bullards Peak.

Wea. SATURDAY 8 Ther.

Deadwood, Dakota
Mountains

also Lookingglass
Carters Creek
Copper Mt.
Mexican Valley
Comercida Co
Nevada

Wea. SUN. NOV. 9, 1902 Ther.

Dracut near Lowell
in Middlesex Co Place
Vein of Mica from Phosphate
opened, Co provided with
holes - faced perhaps there
is the Chandler mine
deserves mine, plus was
good ... Geller was
Sabt Sles 1877 it was
opened

Wea. MONDAY 10 Ther.

Nova Scotia
At Bathurst near
Rhapsody Mountain at
Quacol + Upham
at especially the falls
place near Bonnie
of Hammond River
Lead is very abundant

Wea. TUES. NOV. 11, 1902 Ther.

We have left
West become front Chills
Covered with only few
inches of soil West
of the Connecticut River
it is a very Serpentine —
the primary rock region
especially in Leverett
Whately & Conway
occurs in low places

Wea. WEDNESDAY 12 Ther.

in Plainfield in
Talcose slate rocks
Manganese
at Conway Vein black ox
Manganese Sessions Cliff
Wade - 52 part of
Vein Quartz & garnet
Mn not very abundant
on surface —

Wea. THUR. NOV. 13, 1902 Ther.

Not explored think
be found large quantities
Explains no bed or vein
on top of a hill in
Hinsdale N.H.,
adjacent rocks not
visible —
also bet 1 & 2 m E of
Center of Village of
N.H.

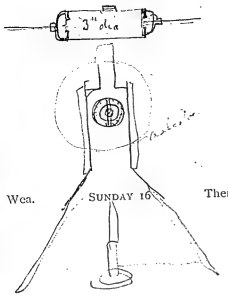
Wea. FRIDAY 14 Ther.

Vein
Black ox Mn

We noticed at Sharon
Rocks bedded
with Cobalt blue slag
Miller investigate Sedbury
Region —

Wea. SAT. NOV. 15, 1902 Ther.

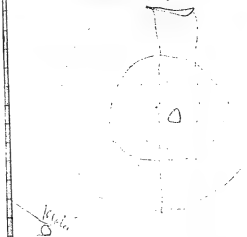
John Ott make a Roaster



Wea. SUNDAY 16 Ther.

To roast pyrites therefor Cobalt Separation —

Wea. MON. NOV. 17, 1902 Ther.



Wea. TUESDAY 18 Ther.

Have Dr Fry Hornsdale Sulphide process on a 0.60 Wad Worm or RDC for 50 mesh Crush & 100 mesh Crush 24 hours, insufficient Sulphide see what Efficiency is —

Wea. WED. NOV. 19, 1902 Ther.

Write Edward F Pittman
Govt Geologist
Sydney
New South Wales
for Copy [illegible]
as he has maps of
patented & unpatented
Localities same as
Canada also of

Wea. THURSDAY 20 Ther.

The Capitol Wed
deposits are fairly
well open for prospecting
or lease generally
Glen Worth Quiz
Phone man [illegible]
details
of Gold with in Sydney
[illegible]

Wea. FRI. NOV. 21, 1902 Ther.

Coal & [illegible] to
Bungoma also Port
Macquarie. Info —
If can find there the Gold
Specers & all Barrels
are plent. Gill off Esther
Place or upper Lines
or fat on Pyrrhoilline —
Labourers pay Miners pay
Board etc,

Wea. SATURDAY 22 Ther.

Make some oval
tubes with rings
& let them Expand to
round —

Order some Pyrogly
Glucose, Obtain some
from C. P. Sachs
glucose,

Wea. SUN. Nov. 23, 1902 Ther.

Cooper to make
some Anodes from
Otising. C.W. [illegible]
also some Copper from
Chrome [illegible]
low voltage —

from the anodes
small lead flake out
by place to test
if C.P. anodes +
2 cellular work [illegible]

Wea. MONDAY 24 Ther.

the problem without
or with Chromic —

Bergman to have
Nickel + Fe stripped
at rate 50 cells
for 6 weeks
then 100 cells old
map

Wea. TUES. Nov. 25, 1902 Ther.

order new 300 Tu
Hydraulic for [illegible]

Sufficient Boiler [illegible]
Welders for [illegible]

also Bergman new
Iron [illegible]

Bergman to get
drawings new
tube [illegible] tube
drawing — [illegible]

Wea. WEDNESDAY 26 Ther.

Ender + Ugrid —

Order Copper drums

Design Soaking Tanks
for flake — K Cy
Wash [illegible] etc

Sheer made good
also good [illegible]

Wea. THUR. NOV. 27, 1902 Ther.

test billes Rogers
for Nahmon Road Co
pipeline & the
Ranch Lorne Mill.

Wiley Come to arrange
see about 60's machine
Silent - in our show
Rest Cement,

John about money
for Cement not rec'd
among -

Wea. FRIDAY 28 Ther.

Put bonds of N.Y. & Stock
Co stock away
write in Name for
transfer -

Wea. SAT. NOV. 29, 1902 Ther.

arrange Berryman 9th
same time 1 o'clock
2 o'clock get coat
until we get grain
here -

John about
test Chain for Cement
Contractor test with
new present chain
against new ones -

Wea. SUNDAY 30 Ther.

Wiley about cleaning
End 10 ft 1 o'clock get
in steam heat!
Do we can keep
new bldg -

Wea. MON. DEC. 1, 1902 Ther.

Wea. TUESDAY 2 Ther.

Wea. WED. DEC. 3, 1902 Ther.

gq Kichline
Palmdale
Los angeles Co
Cal -
gave samples Co
brs -

Wea. ~~THURSDAY 4~~ Ther.

KDC - 1076 - 1075 1079
Was 20 ft thick
1/2 mile long

Wea. FRI. DEC. 5, 1902 Ther.

group [illegible] Max
Water - good flake
4000 glucose

group [illegible]
Max ammonia
good flake 4000 g

Reg group 21650
Moderate [illegible]

Wea. SATURDAY 6 Ther.

Thick [illegible] glucose

Reg group soaked
only once 12 hours

group put right
in hot soaked

Wea. SUN. DEC. 7, 1902 Ther.

group green put
in Stirring [illegible] 24
hours dried out

group in [illegible]
HOH, 24 hours
rinsed [illegible]

25% Cobalt
precipitated with

Wea. MONDAY 8 Ther.

72 - showed work
as green proof
without Hg the
Co never developing
Hard enough
a Conductor —

Wea. TUES. DEC. 9, 1902 Ther.

group Dunlop numbers
groups on after
[illegible]

group 10 run in
15% [illegible]

[illegible] 21%
March

Wea. WEDNESDAY 10 Ther.

group run in 15%
March

Select 1/2 dozen second
tubes soak out dry
& then use the mix
with 7000 Co flake
mix thoroughly & pack in
practicular [illegible]
[illegible]
[illegible]

Wea. THUR. DEC. 11, 1902 Ther.

group 5000 glucose 9000 flake
" 6000 " "
" 9000 " "

Patent ruby flake for
flading. No Co No Co
deadening out No 6y
Ruby —

Make some flake Co
sheet 0001 00005

Wea. FRIDAY 12 Ther.

Run the Hydrogen &
test on off side — Kept
for embrown — drills
not run the off drills
run on Nitrogen —
drills off at high temp

group 1/2/1000 Co
flaked tubes on each
side marked by
1/4/1000 —

Wea. SAT. DEC. 13, 1902 Ther.

Dumps at Cement for hopper so belt gets dump at both ends Cement fire on top – bent this morning top 6 hours with other than 132 with some 5' dumps –

~~Group unchanged for 4 group Sunday 14 1902 in 24 hours chg~~

Wea. SUNDAY 14 Ther.

~~Group Ship 50 all fires in~~
~~" " 60 "~~
~~" 70 } 450 g/hr~~
~~100 "~~

~~9000 flake –~~

Wea. MON. DEC. 15, 1902 Ther.

Take regular morn change & dressings, one or 2 hours or take old mass from dry cards; change fully soak out in alc. shot, & press 250 out in vacuo also of dest he out dry out in air & press of heads dry out in Vac & press also try bill Reg Hg Fulm & new Cutting Press –

Wea. TUESDAY 16 Ther.

Try paraphrase a mass from boiling pressure out 6 hrs

Precip Manganese & Nickel together 10% $Mn(OH)_2$ – test on bases getting out MnO_2 by changing KOH until ace. test,

Wea. WED. DEC. 17, 1902 Ther.

353-1-2 [illegible] 353-4-5 " " " "

Try Acetone in Ichanol
Condensate the Zn-dust in Hcl
in the H2O, the acetone holding
it in Sol'n or better add Methanol
Cut to the KOH Continuing
[illegible] — Then will keep
the reduced Cu in solution
[illegible] —

Try [illegible] Cell with acetone

Wea. THURSDAY 18 Ther.

[illegible] KOH, use of Hfluor. Pt
by holding it [illegible]
Dates getting [illegible] might
be [illegible] for [illegible]
[illegible] —

Wea. FRI. DEC. 19, 1902 Ther.

To get porosity in the Pt, prepare
something with it inclosed —
[illegible] at low temp
like Camphor [illegible].
Neighborhood —

prepare M 504 — Hg Nitrate —
Try Nabb, dry, precipitate
then precipitate with weak KOH
+ Acetone to dissolve the
HgO —

Wea. SATURDAY 20 Ther.

Take old worn plate in
dissolve out KOH, then dry +
remove the Pt-powder +
make new Cathode, run
also with Cell & new mixture

Make old & new Pt-powder
in tubes — Chg + dis —
then Compared at 1.25
& to Compared at 1.25 then
compare discharge fully —
get KOH out + Re Cor to 270 at

Wea. SUN. DEC. 21, 1902 Ther.

350-1-2- 9.5 grs alum 25 grs [illegible] Co Sulph 1 oz 15-45 oz [illegible] Co Sulph water 1 oz - 50 T [illegible] 1 oz [illegible]

352-4-5 [illegible] alum [illegible] 2 oz [illegible] Co Sulph 50 DT [illegible]

356-7-8 gm 21950, 1 oz 20 grs alum in Ni plated T 50 DT - 1.50 glue - wet Stopper

Perhaps best thing to mix with Ni Sty for porosity is a Sulphate of an organic base instead of Ni Sulphate but I am not an Organic Chemist. The Ni Sulph is organic Sulphate [illegible] for instance Sulphate Strychnine

Wea. MONDAY 22 Ther.

Yes, on account of general Atomic wt very little of organic base in a Ke large porosity

Chl Ammonium at high temp decomp & form Chlorides but no Combin with any Acid [illegible] Wed

Wea. TUES. DEC. 23, 1902 Ther.

Probably make some Ni Sulph with all the green salts left in [illegible] with tube Cells 200 grs [illegible]

Mix 7 oz mix with Co Sulph flake, moist - [illegible] plates, 250 [illegible]

Get dozen old Ni plates & see [illegible]

Wea. WEDNESDAY 24 Ther.

Collect those red yellow Crystals to Dr Cram [illegible]

Mechanical & Combin with Lime form [illegible] Sulph salt many [illegible] [illegible] have in Ni plates only Ba [illegible]

Wea. THUR. DEC. 25, 1902 Ther.

Group 4500 2/10000
thick - 4000 gl
21000 absorbed to ——
50 mmps Co plated

drop Ni plated
also 6000 flakes 2/10000

Make Nickel plate by
Cu Ni Cu Ni etc
also Cu [illegible] and
H_2O_2 also Sulphide
& Hypo - H_2O_2 also -
also H_2S — very acid
solution — which causes
CuSO4 deposits — also
wash in KOH with
Tannic, Salicylic etc

also plate Ni Fe
Ni Fe - dis Fe and
use Chlorine

Wea. FRIDAY 26 Ther.

Wea. SAT. DEC. 27, 1902 Ther.

1 Group Rg green 21000
absorbed to 22000 Co plated
good flake 4000 glucose
detto Ni plated

2 Drop 21000 absorbed to
22500 - Co & Drop Ni plated

3 Drop 21000 absorbed to
23000 — both Ni & Co
plated Lisbon

Wea. SUNDAY 28 Ther.

4 Drop [illegible] with
2500 glucose -
all No 1 2 3 4 4 to
have green thru
40 mesh —
Drop the whole
batch again
through 80 mesh

Wea. MON. DEC. 29, 1902 Ther.

Record in big Experimental book to try in Embrocations with Camb Strong, every kind of liquid other than KOH. which is used not used in the Sr Cond –

glycerine Camphor Fe chloride also Ca to separate in KOH – try group with 250 mely glycerine

Wea. TUESDAY 30 Ther.

also group with 500 mely glycerine

Ask Ralph How perax & Barium do for getting rid Co & FeO_3 at same time – it also cheap

Wea. WED. DEC. 31, 1902 Ther.

group of Ni & Co plated in 21% KOH, made by precip K Sulfate in Ni Vessels by Bach,

Series of groups as low & as high – 4000 glycerine different strengths – 900 a Co plate – Ind 20 40 60 80 [illegible]

NOTES FOR 1903

dis Chl Ni in 95% Ethyl also Methyl Alcohol Precip by Alcohol [illegible] Chlorides [illegible] groups

Name	Residence
Group Thro 60 — 9000	
40 do or 4500 — 100	
Quingle Tumpes —	
also group 75 singles	
Big plot sing 3 times 21000	
Thro 40 + 4500 — 9000	
Ni tubes + Co tubes —	
Filled in tubes by funnel	
Group Ni + Co tubes	
Zero and to 2 600 —	
4000 + 9000 Thro 40 mesh	
but mixed a long time to	
distribute properly	
also Zinc (sprinkled) 22000	
mixed long tubes	
Thro 40 —	
Group Reg 4000 9000	
21000 about — 50 T.	
Soak Hot old way 1½ KOH	

Name	Residence
dello Dip hot 135 in	
21% KOH	
Group Reg run in 10% KOH	
10% NaOH —	
group Loop thro way mixed	
before plug —	
Group Reg percolate out	
Ilec dried — then Run Reg	
dello Ni plated —	
dello after drying	
Soak Conc MeOH in	
Methyl al — dry +	
then plot in 135 Temp	
21%, get OH coil	
group Ni plate —	

ditto - Soaked Bismuth Solution -

Group having its green Soaked in a 10% Bismuth Sol, then boiled KOH, Mark the Bi not a solution ~~then~~ started.

Filtered Bi Solution washed not decomposed by H2O
If infer - Prepare Bismuth Solution Either (1) Intermediate by adding Nitric Bi to mixture put into Ammonia & Hydroxide Solution
Fred 6th. Use KOH to roll a mass
Green from old work

also group with water

Important - Very Important

Take out the one Ni plate group that had ammonia + Bismuth then in 15% KOH + then put boiler green

other group put in 1% KCy for little while -

Make 9 tubes with green only Co plated tubes +
Drop of 9 tubes Ni plated tubes green only - Remove on
To determine if solution has anything to do with it

Examine No. 63 4+5

Group Reg 21000 good 4000 - Single Temp
Co tubes 6 in group
Drop Ni plated 6 in group -

Soakhot couple descends Cobas
in old beat Hypophosphorous +
also. Arsenic — one ethereal
gives beat no results before —

Heat green in KOH, 21% containing
~~[illegible]~~ Iodide K to 135° fuse
acc of Champs color — say 2% K
ditto 2 or 3 fuse Aluminum
ditto Hydr in acetone in KOH
ditto Silicate K + H_2O —
If changes color probably Cobalt —

½ pale in KOH, V manganese
Salt strong — ~~[illegible]~~
~~[illegible]~~ not study in rectifier

Wad — powder put in KOH,
pass chlorine to peroxidize
Mn + free the Co Ni —
wash & also by commercial
also by H_2O_2 + then
Exhaust ammonia —

Green mass by $HgCl_2$ in
Methyl propylic Nitrite
Methyl [illegible]
then dissolve heat water —

ditto Ethyl prop —
also with Ethyl water insol
but mass —

also other Inorganic
organic in cobalt
$NiCl_2$ Salicylate —
glycerine, Etc —

Aluminum hydrox dis in
Methylamine but not in
ammonia — $NiCo$ Cl dissol
also — acc of Copper does —

Sodium Hexamethylphosphinite
Sol alcohol, drives to gummy
mass from water [illegible]
in Cel solvent. Binder

Sodium Tetramethylphosphinite
thick gummy sol on Evap
trompt but Colloidal
mass Binder

Chlorate of Potassium is used to remove wood out of bare rocks. [illegible] from Cloth — possibly it may be the Chlorate that improves the old pockets in mining the mine —

Na Hypophosphites very soluble in water or alcohol tastes on rod of Glass like [illegible] [illegible] Ferric Ox. & all Ox — not Nitrates

Quinone, Thus and has greatest process of Crystallization known Even of small quantities one sublimes the Crystals are in such bulky dis in a very quantity in boiling water & it is so Volatile that even at ord. Temp. it sublimes from one side of the vessel to the other strong odor irritates Eyes Sol hot alc & Petroleum Spirit

mix of Quinone & Quinol Equal molecules forms Quinhydrone, Most beautiful Sol. of Ferrous Sulfate, Ferric Sulfate O converts into Quinone & Reduces Sulfates Quinol — Battery

Quinone is a powerful oxidizer & a powerful depolarizer & is reduced to Quinol & reoxidized to Quinone Thus only a trace —

Quinol is Crude Hydroquinone trouble is dissol. Sol in Hot water

Have tried all Experiments of the old Labs & Entered them in My book I have at Hegers —

to make Silicate K think
Can use Solid KOH, melt it
& add the hard powdered
glass K Silicate, it will the
dissolve & Solidify on
~~heating~~ or Can the Ge
ground up fd. Lebrande
at Silver Lake,
or NaOH & K Silicate done
same way

Smoking melted fd
will not H_2O_2 or some
oxiz agent like it burns
Cu S to Sulphate & more
& Dolomite

How about perchromate
K_2SO_4 Sol alkaline ment
Hypochlorite [illegible]
possibly Sulphuryl [illegible]
& attack [illegible]
Hypo-Lime

Fuse Acid Sulphate K
add ferric oxide —
then Roasted Arsenide
Raise heat till no more
white fumes Comes off
Result Sulphate Co Ni
which not decomposed
at Red heat &
Arsenite from which
when all SO3 Driven off
is absolutely insol
in the neutral solution
its insol in all
Neutral Sols —

~~[illegible]~~ Lixiviate &
precip by Carb K —
The Sulph K after
removal Co Ni
made BiSulfate
a green [illegible]
no bismuth Even by H2S

Date		Dolls.	Cts.

of mixed Chlorides of Mn Co & Ni are ignited & a stream of Hydrogen is passed. The Co & Ni are reduced to the metallic state, owing to HCl — whereas the $MnCl_2$ is not effected.

Statement in Watts on separation of Mn = Sep from Ni Co

With water, whole dis in HCl, evap & put in Cylinder ignited & H passed — HCl absd in water —

Whole dissolved in Water & $MnCl_2$ & $FeCl_2$ filtered. H by from — Leaving Silica, Co Ni Etc.

Date		Dolls.	Cts.

The $MnCl_2$ & $FeCl_2$ ignited in a porcn Vessel & decomposed to HCl which used in fresh batch.

The Si Co Ni dis by HCl. made sulphates & Co separated by Cyanide, both ignited in H to get back HCl,

No loss HCl — by this process —

H made by ~~[illegible]~~ Reducing Fe_2O_3 by Co, then passing Water Vapor — then CO Etc —

NOTES AND BILLS

Date	Drawers	Time
	Roasted Arsenicky Co — H2S Reduced while H2S — poisoning. Assailant. Violent poisoning & suffocation. F2 Co H2 remain — to obtain H2S pass H2 over pyrophoric but gives H2S + prolonged.	
	Separation Mat Co — reduce by Hydrogen to metal pyrophoric Let in KCy dissolve the Metal — this is better & cheaper than Acetone	

RECEIVABLE

No.	Where Payable	Due	Amount
	Gas retort, Brequelle Pump by pass H2 — Precipitate previously coat with probable Mn from solution Co Ni Zn group by H2S Sol neutral by Chemic Mn — Thus zinc closer to group second for Brequelle — but to red — Natural with Impossible to show growing in — Ephemeral by water Keep Co H2S in Nitric Sol / Solid in possible Ore Just be used to keep sol neutral if really ground — get H2S by HCl + pyrophoric of MnS	

NOTES AND BILLS

Date	To whom given	Time
on	1st 50 Hat, Corrugated with rings as after fully accounts group most, – Trip	
	21000 Ilus 48 –	
	9000 Coffeeli – 4000 glue	
	Corgate 150 at rings [illegible]	
	dittos Corrug 200	
	" " 250	
	" " 300	
	Hunk Hypos chemicals by dispatched – with Co & Ni tubes – also Dup group	
	Run Cold –	
	also group thro 20 Cot Ni tubes –	
	Heat runs only –	
	Above with Burs outside – also	
	Reg Ilus 20, burs outside	

PAYABLE

No.	Where Payable	Due	Amount
	Group with	Chlorate K	
	"	Slemate K	with
		Albumen K	
		Humate K	
	M film on Cu – mix chromic acid & sulphuric, see of this Cu Nut Ni – dittos		
	Sulac & peroxide hydrogen also soak H_2S a little acid & then Chromic & Sul acid, H_2O_2 & Sul acid, alternately		
	Soak polysulfide K, H_2O_2 or Bichromate K – or Permanganate K –		

Date		Received	Paid
	Nov —		
	Took Red Fe from Sulphate		
	with Nitrate Bismuth,		
	Nitrate & Nitrate Cal		
	Nitrate Ni —		
	Tequila lead [illegible]		
	1/5 of 1/10 N Cobalt		
	Nitrate — mix Fe Red		
	also a of Fe Red & Ag		
	Iron from Sulphate Nitrate		
	Chloride — dec HgO —		
	Prussian blue —		
	Cupro cyanide of Iron		
	Teamaign decided Hg [illegible] —		
	Plate Zn & Fe together		
	Eat out Zn by KOH. [illegible]		
	Dried forget charge		
	Reg iron — Took out		
	KOH by alcohol		
	dry & heptane to get		
	off more bismuth — [illegible]		

Date		Received	Paid
	dissolve ferric Chl in alcohol		
	add KOH in alcohol		
	precip + boil + wash + test.		
	Try some with Ferrous		
	Chloride —		
	add FeCl ferric &		
	Cupric Chloride mixed		
	— alcohol & precip		
	by KOH in alcohol —		
	add Ferric Chl &		
	Cadmium Chloride		
	mix wash & with Hg —		
	for only Fe & Cd		
	will work Nicely		
	together,		
	try Cd alone mixed		
	with Hg & wash,		
	also Cd + Bismuth,		
	Fe + Sb + Hg or not		

Date		Received	Paid
	Dyer pasted new strings on New Rolls -		
	Group Mekels tubes proceed by putting in punch from temp then punch holes, temp also hv about 45 Sections, No glucose —		
	Dup this group a Corrugate		
	group with Sulphide Cuttings 500 grm in KOH 2 each dell — precipt a Sulphide		
	Group Warm green this Soak in cond Chloride Ni + Methyl alcohol — dry a then 9000 fade 4 h Cuoxide — put tubes in 1½% KOH, soak out Cuoxide & funnel bell in 1½ KOH to get rid Gasco Soth —		

Date		Received	Paid
	dilute a group 9000 — 4000 after soak out dry then soak in $CuCl_2$ — Methyl once a month — then put in KOH 10% boil nearly to boil —		
	Dup above by Corrugating		
	Arrange groups Reg tubes good — 4000 burs about		
	Sec of Hypersulphite Soda dissolve Copper a double salts formed - dem 6 - dem then check — 20 gm Hyp 1½ litre dis 100 mil Sat Cu bic concentrate run through the flake & Cu precip by KS a Hydro separated — Hydro for Nickel flake or Cu/Ni.		
	Try Educate of Ammonia in Lelande —		

Date		Received	Paid
	Group in acetone —		
	Pure acetylene with Cu Cl/Hcl		
	0 drops 2 drops Copper —		
	Ammo Cu Cl with Copper		
	Copper —		
	Make some green with		
	1 2 5 and 10 drops Cobalt		
	in it = look in tubes.		
	Group Reg Ni in mixture		
	of salts 50 T.		
	Also Conjugate —		
	Also with green — group		
	& glucose —		
	Distill Force Chloride		
	to get it pure at Lowman		
	Camp —		
	Then fractional distillation		
	& spectro to see if		
	there isn't more than 1		
	~~Produced compound~~		

Date		Received	Paid
	Get 2 or 3 lbs		
	Opalate from absolutely		
	Cl free & make some indow		
	Mix + Cl Hg —		
	See if Fe comes in impure		
	Series of groups of 3		
	Reg plates Ralphs New		
	pieces from —		
	No Hg — then 1% 2		
	3 5 7 10 15 %		
	Dep with Hg		
	1-3-5 10 15 25 Copper		
	33% 50%		
	Dep 1 Cu 3 Hg — 5 Hg		
	7 + 10 Hg		
	Dep 3 Cu 3 Hg 5 7 + 10		
	Dep 5 Cu 3 5 7 + 10 Hg		
	Dep 10 Cu "		
	Dep 15 Cu "		
	Dep 25 Cu "		
	Dep 33 Cu		

CASH ACCOUNT—APRIL

Date		Received	Paid
Dup 3 Bismuth,	5	7	10
15 25%			
Dup Bi 5 Hg	3	5 + 10	
" 7		"	
" 10		"	
15		"	
25		"	
Reduce some New Fe Cl			
New prices to Nov —			
pyrophoric oxide,			
then dose 15% Hg &			
test, 1 gram test			
by testing washing			
+ Reprecipitating			
Dup above, with			
iron mixed with Coffin's			
Same as Ralph			
by equality Sulfide			
Then sound Sulfide			
+ Ra equality			

CASH ACCOUNT—APRIL

Date		Received	Paid
Think this			
a good process,			
Dup + put Hg			
in as metal,			
Hole 1 - 44" deep			
Sample 1 44" down			
to Quicksand under			
No 2 35" down			
3 30 - This is iron			
Cup - 4 - just above iron			
Cup 2 4" down -			
1½ is all but 1+2 -			
2½ is all 2+3 -			
The Hole is 44" deep			
Bottom of iron Cup is			
8" up from Quicksand			
its 6 or 8" thick of which			
2½" is block			

Date		Received	Paid
	Hole No 2 42 inches from top to Black Cliff —		
	Very black 6"		
	18 of dark brown		
	Cell begins 66" deep —		
	No 1 to 18		
	2 6" black		
	3 36" shale (sand)		
	4 5" Jap soil		
	group green moistened with NH_4OH & NH_4Cl — then g Green		
	Reg group NH_4Co (cooked with 5% ammonia carbon. [illegible]) of KOH,		

Date		Received	Paid
	also group green absorbed ammonia 24 hours, Dry ammonia No water — NH_4Co		
	also absorbed wet NH_4 24 hours a dark brown		
	Cooked soil in 5% NH_4 NH_4Co		
	group 4500 scale 1 Rho 50 — 4700 Rho 20 — green Rho 40 — NH_4Co		
	Drop above green absorbed Dry NH_4 24 hours		
	It probably NO_2 reduces before any CO_2 reduces hence CO_2 needs remain Conductor until NH_4 used up — groups green 5% CoOH, 10%, 20%, 33% —		

Date		Received	Paid
	Make set of tubes to be Eect open with 30 40 50 60 70 & 80 mesh grain — good flake & from these results make variation with diff mesh with less flake		
	group with Central tube 1/16 dia perforated also solid		
	Mr Plating Co furnished tubes 3 tubes		

Date		Received	Paid
	One box to 160 degrees to test specials = groups to get quicker results & Comparisons		
	Tests done appear in some organic Compd that will give OH, & the tubes 63 Get free		
	Groups pkd with tight fitting plungers & also group pkd with much smaller diameter plungers than Reg		

Date		Received	Paid
	Worth Sulphur Heat		
	Volumes hydrocarb. the		
	Reason put 3 times		
	as much Mucor &		
	no Mucor more		
	Pages 10 & 11		
	NaCl + NaSol - got out by		
	Chilling to 1 Cent, volume		
	4/5 of Sulph Acid		
	Volume [illegible]		

Date		Received	Paid
	26 —		
	group 21000 pod [illegible]		
	[illegible] of 4000 [illegible]		
	3½ lbs Mucor Culture		
	ditto 4 lbs Mucor Culture		
	" 4½ Mucor Culture		
	" 5 Mucor Culture		
	group Reg bottle		
	Co [illegible]		
	Clay in bottle		
	48 or more hours		
	Flat plate non mix		
	Mucor Co plate with		
	mix —		

CASH ACCOUNT—AUGUST

Date	Received	Paid
Chicago Milw & St Paul		
Gen 4s 1989	199½ Rec	112 ord
gen g Ser B 1989	97½	72 W
C & Northwestern		
g 3½ 1951	102 3/4	99 [illegible]
		20 W
N Y C & Hudson R R		
g mtg 3½ 1997	99 7/8 R	
54 W	99 7/8 C	
West Shore g 5s	Reg 106	
	C 106	
Lake Shore		
g 3½ 1997	100 5/8 C	
	99½ Reg	
50 W		
N Y & Harlem	101½ C	
3½ 100 yrs	~~105 1/8 C~~	
12 W	101½ C	
Reading gen g 4s		
1997	C 103 3/8	
	Reg 102 3/4	
60 W	Cod 97	

Groups Rosin & mg — various chemicals — alcohol

CASH ACCOUNT—AUGUST

Date	Received	Paid
Group 40		
absorb dry ammonia		
3500 glue goods		
Co Alum Refg		
Press 1 needle		
Group on offer		
Group Reg KOH, Saturated with Batch, excess put — Co N Lube		
Group Saturated KOH with Lime — Excess put in Co N Lube		
Group KOH Saturated with Carb Barytes excess Co N		
Dills Sat with Carbonate lime excess		

group with goods [illegible] Brunt Needle Industries

CASH ACCOUNT—SEPTEMBER

Date		Received	Paid

CASH ACCOUNT—SEPTEMBER

Date		Received	Paid

180
15
900
180
27

446 | 270000 | 603
2676
34

Date		Received	Paid
	950		
	475		
	665		
	712		
162	970		
	3 570		
	59		
	58		
	162 530		
	4 250		
	158 2		
	124 720		
	7 470		
	117 25		
	123 330		
	4 960		
	118 370		
	117 250		
	1 120		
		3 712	
		237	
		949	
		7 180	
		759 2	
		949 2	
		708	
		336	
		135	
		1 064	
		1 036	
		3 36	
		453	

Date		Received	Paid
	Co Mi Sal		
	1 120		
	350 000		
	50		
	175		
	16 000		
	15 000		
	14 000		
	10 000		
	10 000		
	180		
	125		
	90		
	36		
	180		
	2 55		
		475	
		2 000	
		17 500	
		1 146	
		3 36	
		865	
		4 55	

CASH ACCOUNT—NOVEMBER

Date		Received	Paid
	165		
	1320		
	35	1200	
		1055	
	356		
	27		
	497		
	1122		
	600		
	35		
	560		
	27		
	533		
	1136		
	32		
	4		
	128	3500	
		256	
		3244	
		160	
		3084	
		160	370
			370

CASH ACCOUNT—NOVEMBER

Date		Received	Paid
	150		
	600		
	600		
	600 lbs		
	7200 lbs		
	720.000		
	360		
	260		
	260		
	360		
	150		
	520		
	360		
	1080		
	1080		
	90		
	250		
	250		
	1250		
	500		
	6250		
	6250		
	6875		

CASH ACCOUNT—DECEMBER

Date		Received	Paid
	446		
	3		
	138,000		
	97 000		
	60 000		
	14 [illegible]		
	75 000		
	12 000		
	1 000		
	1,543 [illegible]		
	150		
	850		
	1,549		
	1,200		
	200		
	160 000		
	375 000		
	1,500 000 000		

CASH ACCOUNT—DECEMBER

Date		Received	Paid
	382		
	80		
	2674		
		382	
		200	
		764	
	1990		
	192		
	398		
	398		
	1791		
	1790		
	80		
	3820		
	456) 76400		
	456		
	308		
	278		
	30		
	24		

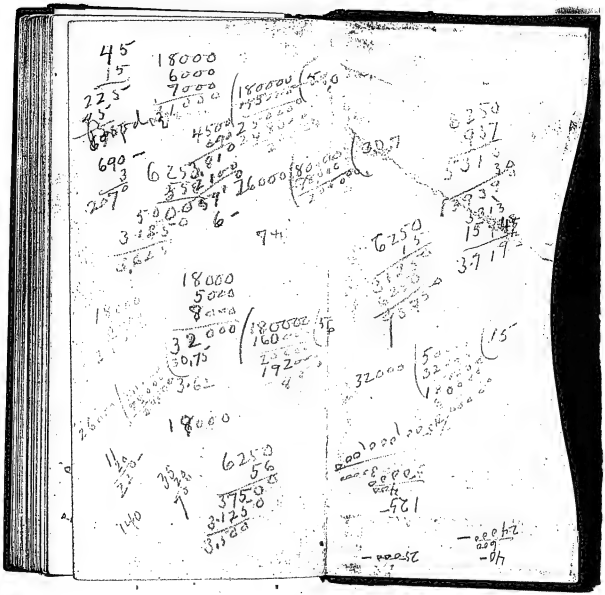
SUMMARY

	Received	Paid
Cash on hand Jan. 1	6250	
JANUARY	5730	
FEBRUARY	6250	
MARCH	6250	
APRIL	6250	6250
MAY	4397	5313
JUNE	18750	
JULY	19181	
AUGUST	1926	
SEPTEMBER	5313	
OCTOBER	367	
NOVEMBER	37191	
DECEMBER	15309	
Total	19109	5313
Balance to new account		19109
		34003

Calendar for 1903.

1903	JAN.	FEB.	MARCH.	APRIL.	MAY.	JUNE.
SUNDAY.	. . . . . 4 11 18 25	1 8 15 22	1 8 15 22 29	. . . 5 12 19 26	3 10 17 24 31	. 7 14 21 28 . . . .
MONDAY.	. . . . . 5 12 19 26	2 9 16 23	2 9 16 23 30	6 13 20 27	4 11 18 25	1 8 15 22 29 . . . .
TUESDAY.	. . . . . 6 13 20 27	3 10 17 24	3 10 17 24 31	7 14 21 28	5 12 19 26	2 9 16 23 30 . . . .
WEDNESDAY.	. . . . . 7 14 21 28	4 11 18 25	4 11 18 25	8 15 22 29	6 13 20 27	3 10 17 24 . . . .
THURSDAY.	1 8 15 22 29	5 12 19 26	5 12 19 26	9 16 23 30	7 14 21 28	4 11 18 25 . . . .
FRIDAY.	2 9 16 23 30	6 13 20 27	6 13 20 27	10 17 24	8 15 22 29	5 12 19 26 . . . .
SATURDAY.	3 10 17 24 31	7 14 21 28	7 14 21 28	11 18 25	9 16 23 30	6 13 20 27 . . . .

1903	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.
SUNDAY.	. . . . 5 12 19 26	. . . . 2 9 16 23 30	. . . 6 13 20 27	. . . . 4 11 18 25	1 8 15 22 29	. . . . 6 13 20 27
MONDAY.	1 6 13 20 27	3 10 17 24 31	1 7 14 21 28	5 12 19 26	2 9 16 23 30	1 7 14 21 28
TUESDAY.	2 7 14 21 28	4 11 18 25	2 8 15 22 29	6 13 20 27	3 10 17 24	2 8 15 22 29
WEDNESDAY.	3 8 15 22 29	5 12 19 26	3 9 16 23 30	7 14 21 28	4 11 18 25	3 9 16 23 30
THURSDAY.	4 9 16 23 30	6 13 20 27	4 10 17 24	8 15 22 29	5 12 19 26	4 10 17 24 31
FRIDAY.	5 10 17 24 31	7 14 21 28	5 11 18 25	9 16 23 30	6 13 20 27	5 11 18 25
SATURDAY.	6 11 18 25	1 8 15 22 29	6 12 19 26	10 17 24 31	7 14 21 28	6 12 19 26



Notebook, PN-04-06-04

This pocket notebook was used by Edison during the period June-October 1904 for notes on experimental work to be performed. Among the experiments described are many that pertain to the chemical composition, construction, and electrical capacity of Edison's alkaline storage battery. In some cases Jonas W. Aylsworth is indicated as the proposed experimenter. Also included are several pages of rough calculations, a list of the number of employees working for various departments of the Edison Storage Battery Co., and a note about a worker at the Edison Phonograph Works. The front cover is stamped "Pass Book." The pages are unnumbered. Approximately 25 pages have been used.

RN-04-06-04

Corrugate pockets first then
fold & Crimp with very light
Corrugating pressure then will stiffen
Cups & at same time get permanent.

Run Curves on Fe at Slake
with various pressures to get
Variation possible

Run Fe — Hg Cyanided Cups
or Hg Amal to get Cups
amalgamated —

Picked that which once
good but by many changes
has gone bad try washing
& drying brine along
at

High chg V due to Na Vit. p. from
Opaloski the Con Fe Wm Fe

2 clean unbroken outside Hydrogenized
cups placed in cups filled with
H_2O + pet 24 hour KOH
with strip cups that had oil on
spots that showed burn off or quite
smoke also filled with H_2O
showed perfect coagulation with clean
cups and coagulation on the oily
cups where oil spots were.
for high discharge this showed bad

Our cells having failed to give results
16 to 18% of what they should give, we slightly
turn in order to find trouble
following is results.

1 Lack circulation — measured +	no effect
2 Green cups of normal rate	"
3 " " hydrogenized	"
4 Well washed cups of normal rate	"
5 Cups nearly clean perf "	"
6 Lot phosphates in KOH	"
7 Lot HCl "	"

8 – Changing KOH 26% after each change No effect
9 " " " discharge "
10 " 5% " " "
11 " " " change "
12 – Charging & discharging occasional turns in 5% KOH then 24 hour charge & 24 hr discharge No effect
13 Reversing cells for time then 24 hours " change & 24 hr discharge "
14 Reversing Ni against Fe in high rate then Rep Charge Dis Even comparison all the
15 – Not allowing Ni mix to absorb KOH overnight & charging next morning No effect
16 – Letting a particular sad cell represent charging & discharging unimproved 20 amp but sudden cell that work badly improved = both Nickel cells were in best condition of 40 4-years old, which better than the Nickel cells represented bad cell taken apart that the wheel was not of pressing stuff –
17 made cell up of Ni plate & Fe plate having quite different current of 2.5 amp for 10 minutes in 40% KOH, scrolled 10/1000 No effect
Finally found trouble due to Iron not
18 ~~[illegible]~~ Nickel & probably
the ~~[illegible]~~ dirty Copper helper –

The Cell pressed against the shorting had less than 4.15 cc of mix varies there no marque – Hinsfeld was Rep 7 c average above 4.6 that Cannon average of Ni mix average 3.300 thing is possible that it was not back of mix that all the trouble was due against changed our nickel feller so it would load the pockets perfectly Even – More now + was loading on nickel pockets provided cells 15 pockets 14 pockets
There is only one way to feel Ni pocket is even to clean it by following ways to fill pocket naturally + by gravity the scraper of a roller Hammer [illegible] 1/32 dia fixed + not expensive
& the roller of wrap Cannon cell on + Cannon are drag on big space [illegible] on the face – The mix ~~must be applied~~ on pressed yet most scraper + made [illegible] stuff
Cure should be taken to keep Cannon free of mix at Channel [illegible] as Cannon uneven feeding by causing bridging of filling the pocket with pieces of big mix

June 4. 1904

Experiments on charging Bag pockets

Standard) mix which is 30 min old hours

then [illegible] Corrugated –

1 Fe 2 Ni – Lilli. 2000 –

1 (charged) 3 hours gave	915	to Varnish	1240
1 " 6	953		
9	953		
12	971		
15	991		
18	993		
21	1011		
24	1001		
27			
30	1033		
36	1038		

one previous 24 hours when charged 2.41 hours

9416 –

charging used 200 ma for

3 hours got	221		600
6 " "	505		1200
9	710		1800
12	815		2400
15	900		3000
18	950		3600
21	978		4200
24	981		4800
30	1018		6000
36	1026		7200

Calgary Exp't 3.2 Ni

Dry mix not corrugated	79.6	102.3	97
" ~~corrugated~~	~~83~~	~~95~~	~~94~~
Mix 1 hour in air	78.6	92.6	98.6
" 3 " "	78	100	97

Filled pocket loose put under bell jar with sponge warm 1½ hours

~~Passed~~ flat	76.7	96	95
Corrugated	83	95	94

Mix in loose pocket all night under bell jar then Corrugated

	85	91	95
	84	95	97

dilute smaller dr 76 95 97

77 97 96

a hot pocket passed hot + Corrugated hot

94.8 against 93 not hot

When we lost capacity in cells at finishing Burr + some Palladium + not reg gaing made 12 cells both Fe + Ni plates at night + then then right through – they were fine all evening 152 amp to hold 18 plate cells – 1/2 charge after and about 1 charging working some but they were bad – probably caused was Burr more evenly felt Ni pockets by doing it himself + stood + got hanging Fe plates – The last were corrugated

June 4 1904

to determine if fault was due to dirty cups.

2 cells outside & inside cups plated in the strip cupped in 1½% KOH dried washed Naptha & dried and many washing Results OK

3 cells Outside & inside cups plated in strip, Cupped in KOH 1½% dried washed Naptha & then washed very clean Results OK

3 cells Outside & inside cups plated in strip cupped — 1½% KOH. dried washed Naptha dried washed very clean annealed in hydrogen Results OK

4 cells O & Y cups plated in strip Cupped KOH. dried washed Naptha dried and many washing annealed in hydrogen = Results OK

June 4 1904

6 special test cells Outside & inside cups plated in Cup old way ——— get results.

In charging we never No Voltage try OP in KOH set out inside cups coffee and KOH & then lower charging voltage

test charging economy on Cobalt hydrogen charge 7c with Hg dope —

look out for hollow bottom to inside pockets make uneven loading

Look out for another important Problem on plated parts hydrogen reduces Cobalt side

June 4 1904

Odor on copper turns them darker
A Copper held over Bunsen burner
1½ from flame color disappears
2 Cups become bright smoke
Odor off
Effects are due to ~~[illegible]~~
Acid solution & then precipitate
Into Hydrogen the reducer
& sulphide of Ammonia & will not come off
flame but will come
off in Nitric acid

If Rust it will be red
Iron comes through
Acid & can be
off or turns out brown
reduced to Iron

June 4 1904

A good way to prove that either
the Ni or Fe is insufficient
in a Cell which fails to
give proper Amperes Compare
it to discharge to .75 Volt
then Charge ½ the cells
say Nickel against the Con
for one hour & discharge
still further, & the other
½ Charge the Iron
against the Con for
same length time &
discharge further
if back up Iron the
Ni which has been charged
one hour will give very
little & Iron Iron will
Iron — there is some
Charging 2 hours makes
it certain

June 9 1904

33% KOH causes nickel pockets to swell very much but not the iron. The swelling is so great on the nickel that a pocket in 21% swells after say 10 runs from 85 in Cond. to 100 – while in 33 it sometimes swells from 85 to 140, & in some cases pushes the pockets apart at the crimp.

With battery having 5% KOH the Capacity is much less & so practically used of Capacity below the freezing point. 3:2 grams Ni mix in 20% has Capacity of 530 with 2 runs 20% is effected considerably below freezing point. sometimes Capacity is ½ = With 33% 3:2 Ni gives as high as 750 to Volt + the Capacity is accordingly

June 9 1904

affected any below freezing but swell up pockets is unmanageable.

BaOH, in KOH of cell does not appear to harm cell —

Carbonate + oxalate only hurt cell when in great amount & then probably only by diminishing the KOH.

Other radicals like SO_4 NO_3 appear to act to swell the nickel by forming the Colloidal Ni hydroxide in the pores —

Uneven packing of the nickel mix in the pockets is very bad as the whole should be under pressure & the light parts get

June 9 1904

Scarcely any pressure the heavy parts on overcoming raise the force of the Cups of produces lowest pressure on the mix —

Dirty only Cups is good for Contact — floods clean Cups only Cup — KOH + filled with HgO — on 12 hours Silver Cup current Cup commenced & only Cup only anually when charged and oil = It would be impossible for mix to make Contact where HgO would not amalgamate with the Cement

June 11 1904

At charge rate of .75 mil amp per pocket a 18 plate cell at end 24 hours will show any Chg Voltage

50 per pocket	172.5
35 "	166.5
25 "	159.5
20 "	158.0
15 "	157.5
10 "	154.5

This shows that a charge per hour of 21.6 amp is forced in at end 24 hours at 178

14.4	" "	172
10	" "	166.5
7.2	" "	159.5
5.75	" "	158
4.3	" "	157.5
2.8	" "	154.5

June 11 1904

1st 2 hours

75 ma per pkt	169	2
50 "	167	3
35 "	164	4
25 "	160	7
20 "	158	4.5
15 "	153.5	2.5
10 "	151	

6 hours after

75	168	4
50	164	0.5
35	163.5	
25	164.5	
20	165	7.5
15	157.5	4.5
10	153	

10 hours

75	180	change
50	166	
35	163.5	
25	163.5	
20	164	4
15	160	6
10	154	

June 11 1904

18 hours

75	180
50	178
35	168
25	163
20	162.5
15	164
10	157

Have Phase Change at 10 20 & 30 ma & need V to can to see which parts gives trouble

Try getting thro Lamptlock Chalk & other precipitants to get foaming in letters out Koff —

To Lost Radicals to be Tried Letters add Hydrogene phenolphthalein Congo red Tartaric acid — Citric acid

Jan 13 1904

100 Seperations weight 130.300
made by Conton Rubber Co from
Monel 350 to 1 pound

Substances to be added to
KOH of Cell for Catalysis -
Saccharin - Phenylhydrazine
Ammonia,
Tantalic acid,
Selenic acid,
Uranyl -
Turpentine
Aniline - piperidin
Bromic acid Bromate K
Iodic a Iodate K
Cyanic a - Cyanate K
Formic a Formate
Ferrocyanide of K -
Cyanurate K
Nitric

Jan 13 1904
with scrutinal hope

Iron - ux - Reduce by H,
precip or use oxalates
Cadmium - Copper Cerium
Bismuth - Cobalt Nickel
Tungsten - Molybdenum
Uranium - Vanadium Sb -
Tin - Selenium - Chromium

Peruranate K Evolves O at
ord temp - rapidly at 100 C -
Made by adding H_2O_2 to a
Uranic Salt peruranic hydroxide
precip - hydrate - boiling
replace nickel

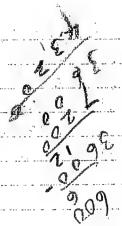
~~[illegible]~~

~~Carbon~~

precip. a little platinum with the iron (10) with the oxalate so we all have Pt black on Fe of Gallery on details [illegible]

Try - phosphite K in bathing list of bad developers or Hypophosphite

If there are residuals or deleterious substances in the Pt or Fe plates reverse them KOH with the sheet & quickly KOH & also change as will as reverse & change KOH in the way might get a perfect CP bath Pt & Fe & get good results



Try pyrolusin & [illegible] 12" dia for pumping [illegible] Collodion from [illegible]

Try 3 parts Hypo. K

~~[illegible]~~

Manganate K good test for metals OK & precip. when all precip ~~[illegible]~~ Salt & Colorless, to better [illegible] the plasmons to don't again heat -

July 4th

Tool room	23			16 — 175		28 00
Press Room	9			55 — 120		70 00
Perforating	7			22 — 175		38 50
Pointing Room	54	night		15 — 175		26 00
Plating Room	26 = 10 —			3 — 175		5.25
Assembling Room	14			10 — 160		16,00
Testing	4	2 night		5 — 160		
Inspecting	10			2 — 240		
Stock Room	5			12 — 175		
Power plant	2	2 night		6 — 175		
Erecting & Dismantling	11			4		
Asst Mgr office	6			1 — 87		7
Supt office	4			2		
Shop Foreman	1			1		
Auto dept	2			1 — 200		32
Drawing Room	1					222
Machine Room	19	Cupping Mach. Drill presses Cold rolled		7 men for assembly 7 for turning		
Total Colo.	48.					

Average Rate = 197 per Hour

Oct 8 1904

Mix with black mix 7c some Calcium Hydrox by adding wet —

also oxide Cdq — also $Co(OH)_2$ $SbOH_3$

— cerium —

Try Running 7c in small cell with 2 pts of Radical Sny Cl — see if it dont clean it so it will not pass on charging thereafter

Oxidize surface of sheet now goo Chalg + discharg Voltage with good Acetate of

when get a good test 7c & Mi thin Electrode to test chg + discharg Voltage

Try Kott made in Vacuum using prime K_2SO_4 — Metallic K, CH_3H_4 & other ways — also Sodium there may be impurities that cause a higher chg Voltage ditto discharg V.

Make some bright deposited CP Electrolytic Iron from 3rd time Oxalate, Sulphate & make Iron oxide surface for these also add on Chg Current to get Oxalate Chg Red by H — see if chg Voltage further

Sloan & Chase
Iron Grinwald
New Haven 7
Specially Dress.

~~Have filed note foaming Cells & see if any relation to Capacity~~

3 4 & 8 Cap
on £18 827 £45
Watching

Oct 8 1904

How Hg may be impure or crow is
certainly impure & may have something
in solution to give higher decomp voltage

150
150
25
25
150
90
90
20
40
185
77
52
40
115

350
45
60
43
43
60
75
75
43
310
310
60
80
80
115
115
115
115
10
20
20
40
40
33
32
2201

175
40
700
315
24
285
306
33
32
32
40
30
45
280
30
33
32
15
25
75
64
6

40 / 750

45
10
31 5
24
285
306
33
32
32
40
30
45
280
30
33
32
15
25
75
64
6

75600
74
74
1
74
100 HP
5
7 / 500
74

20
8
2

40	52
	13
	14
	26
	12
	11
	34
	21
35 -	49
20 yrs	43
	20
Extra 15	15
	510

315
180
2520
315
5670

600.00

600000
600000
3600
6000

K Iodate, Mucks GR- 85c oz 2 oz

K Hypophosphite 3 oz 1.49 26

K phosphate, 2 oz 49c oz

250
175
425
375
1000

50
6
300

350
175
525

12000 / 24
10 10
2000

John A Williams
born 21 at Home
Boy 18 – 82
~~[illegible]~~ lost room 3 yrs
~~[illegible]~~

Notebook, PN-04-07-21

This pocket notebook was used by Edison and an unidentified employee, probably during the summer of 1904. Many of the entries relate to production costs for Edison's alkaline storage battery. Included are labor distribution figures and notes on piecework rates, materials, and other manufacturing costs. There are some similar figures for the Edison Portland Cement Co. In addition, the book contains entries by Edison regarding experiments to be performed, including work on storage batteries and a Lansden electric vehicle. Also included is a list of machinery necessary for manufacturing rubber parts. Inserted into the book is a report on labor and material costs at the Edison Storage Battery Co. works in Glen Ridge, New Jersey, for the week ending July 13, 1904, along with 2 pages of loose notes. The front cover is stamped with the British royal crest. The pages are unnumbered, and several pages have been removed from the book. Approximately 50 pages have been used.

PN-04-07-21

Nickel mix per 18 plate Cell
out — 73.420 per pocket,
985 grammes, or 2.2 lbs

Iron 1.75 lbs per 18 plate Cell,
4.9 per pocket
E

KOH 21% solution in 18 plate
Cell 1200 CC,
Solid KOH in this solution
297 grammes or 1 lb 4 ozs of lb-
get 7 or 27 + 45
E

Weight of ⊕ Separator
1.2 grms Each
Weight of 75/1000 sliced
separators 1 gram
Each-
E

Weights –

Part grms

18 plate, ☐ side rubbers weight. 38.5

" " ~~Side sheets~~ Coat pa

" Side rubber sheets "

" Coat " "

" Bottom rubber weight 24 grms

Coat, per lb

Rubbers hard in the clouds weight

Coat, per lb

Rubbers soft in the floods weight

Coat per lb

Thumbnut rubber parts wt-part 619 grms

Coat, per lb

Rubber soft on filter wt

Coat, per lb

Rubber bottoms, wt

Coat, per lb

Rubber diskapart wt

Coat per lb.

Crate quadrescentum wt Coat

Total wt Coat per 50 Total Coat

Chemical works.

	rate	work
Watchman —	18c	16
Foreman Dorey	20c	16 80
" Merritt	20c	16 80
Foreman — Savery - Ford		24 00
Foreman Fe & ammonia —		23 50
Foreman No 2 - Ni. profedpa		12 00
Time + book keeper		12 00
Storeroom		15 00
Chemist —		25 00
asst Chemist		12 00
Test cup maker + washing		8 00
Errand Boy		5 00
~~Machinist~~		
Test man		12 00
"		9 00
"		10 00
"		7 00
Machinist —	32.5	
Pipe fitter,	22.5	
2nd grade machinist	20c	
temporary Machinist for lab.		

Chem Wks Continued.

No 2 bldg

1 Laborer -	15
1 "	15
1 "	15
1 "	17.5

No 5 main bldg -

7 Laborers	15c
1 Hydrogen plant.	15

Yard gang

3 Laborers, hauling etc	15
1 Rog Carpenter	25c

Jewa + Jum -

Average rate.

$217. per day

Burn June 24th

16145 lbs Coal 24 hours 7.2 tons.

Oxalic acid used per lb of
Fe Mix. 5.25 c lb
H_2SO_4 1.85G. 100 lbs $1.20

Water now — 1.75 c lb. on pay ft
Mg — 25
NaOH, 2.65 per 100 lbs 98%
KOH-Electro 7 c lb — 98% —
Mercury 66 c lb. includes
bottles, have about returning or
getting credit —

Graphite. 7½ c lb. 85 to 88%
HCl — 1.290 1.6 c lb.
HNO_3 — 1.400 SG 3.75 c lb
BaOH — get bill of lat from Europe
Na_2CO_3 — $10H_2O$. 3/4 c lb Recryst
H_2O_2 10 c lb — 1/2 strength Merchant
filter bags — linen 62½ c yard
Coat scrubbing
Cost Water 1/2 c 1000 gal —

filtering Canvas 54c yard
Ammonia 8½ lb.
Oil
Lamps
Packing
Chromic acid

E

Nickel Hydroxide
Plant making up Cost
~~Nickel Sulfate Solution~~ E
Cost of CP Nickel Sulfate Solution

107 lbs Nickel 25 c	26	75
120 lbs Brunton Vitriol 1 20	1	44
Nitric a. 7 lbs 6½c lb E		45
Carb Soda 25 lbs 3/4c lb		20
Labor 10 hours 17½c h	1	75
" 4 " 20c h - (½ of foreman)		80
	31	39

Yield - 975 liters
Cost per liter 3.22c E

Nickel Hydroxide

1114 liters Ni Solution at 3.22	35	87
300 lbs Caustic Soda 2 65/100	7	95
2000 gal distil H2O 3/10c gal	6	00
Labor 20 hours 17½c	3	50

Foreman %		1 35
Cost Lime filters	E	1 60
		56 27

Yield 200 lbs
dry hydroxide –
28.14 cents per pound.

Nickel mix in cans –

150 lbs Ni hydrox	E	42 21
42.3 lbs graphite.		7 19
$5\frac{1}{2}$ liter KOH. $4\frac{6}{10}$ lb –		25
Labor 10 hours at 20c		2 00
% of foreman – 40°		40
		52 05

Yield 1913 lbs – E
27 cents lb –
In Cans with little help from unlabored –

~~Iron mix = Black~~
~~Dopes Iron Can~~

~~= 120~~

~~120~~ 80 lbs per day
of Fe_2O_3 —

Oxalic a 130 lbs	6	82
280 lbs Fe_2SO_4 at .3/10c		84
2000 gals distilled H_2O	6	00
Labor roasting 5 hours 15c		75
gas for roasting 2000 cf 700 S =	1	40
	15	81

80 lbs 19.8c lb —

To get this into Black mix

120 lbs Fe_2O_3 at 19.8c	23	76
240 H_2SO_4 for 7mm	2	88
20 lbs Dope 66 @ NaO	13	20
200 lbs Metal Fe 17c	3	50
labor 1 man 5 h at 15		75
" 1 " 5 " "		75
1 5 " "		75

E

1/2 Foreman	1 hours 40c		40
1/2 "	5 " 25	1,	25
Coke for purifying H, 500 lbs at 75c ton			90
Coke on iron reducing furnace			
1600 lbs 800 per ton of 75c lb		$ 2	75
Labor mixing. Cumming		1	50

Yield 124 lbs black
mag cornet

41.4 C lb.

Treating Rubber for Cables

Coat nickel welding -

Rods

Can sticks

parts,

Graphite Coatings.

KOH Electrolyte

Labor assembling [illegible] plate cell

" 27 "

45

Labor soldering + inserting strips in top plate 18 p cell

" 27

" 45.

[illegible] not Convenient [illegible]

[illegible] room costs [illegible]

Operations Daily Log

Power Costs today
" Coal
" Oil
" Water
" Coal used

Naptha distilling
Table
Naptha, 5'

[illegible] made on
[illegible] cell [illegible] plate

" [illegible]
" [illegible]

[illegible] Nickel plating
[illegible] Nickel.
" [illegible]
" 4/5

Things necessary to increase capacity Plank & Stake Factory

1. 200 18 platens chain by —

Press dept 2

2 Hydraulic press 12" Ram — ordered
1 Intensifier "

Perforating dept 3.

2 perforating Machines Ordered Oct 1 1/2 spindle drill — On hand
2 2nd hand Screw Mac 1 on hand (Oct 1st) 1 ordered
3 acme SM ordered
2 5/8 Cutts Screw M space Washers — ?
1 Oil Separator — Ordered
1 Soda Rattle "
2 1 1/4 Shafting "
1 20 HP Motor, to 40 HP. on hand

Brequetting dept
1 Nickel filling Mac

Assembling
~~1 Boiling Tank - Outward~~

6 Strip plating Mac
2 new Gang hands at Lab.
going order of moves -

Boiler Room
Boiler from Mine -

Rubber parts Cost.
E 18—

Pole washer	1 3/4 Cents	3.5 C
" Insulation	1.4 Cents	2.8
Stuffing box gasket.	.85 Cent	1.7 Cent
Gland Cap	3½ C	7 Cents
Lip gasket	.85 C	
Side insulation	7C	14
Superior Top gasket	0017	
Pocket Insulation, Separator	1⅛ C	9.5 Cents
Bottom Insulation	9 C	
Plate insulation	11 C	22
Block Insulation	2 6/10 C	
Cell Separator right	3.65/100	7.3
left	3.65/100	7.3
Middle	4½ C	9 Cents.
	Total	1.8285

Total E 27 25992

Blezight Compleatin of

E-18- Σ 12.5 to 12.75

E 27 — 17.25 to 17.5

E 45 — 29.75

Price compiled prices of [illegible] 18F

Cans press side seam	.35	per	100
Sheets - Square Sheet	[illegible] c		"
[illegible]	6		"
[illegible]	4½		
[illegible]	4 1/4	cents	"
[illegible]	6		"
A Wire	7½		"
B Plate			"
C Unwire	7½		"
Trim	4 1/4		"
Corrugate side	31		"
" end	31		"
Mark patent	6		"
Notch end short	8		"
" " long	8		"
Edge	11½		
Bend 1st Operation	11½		
2 "	11½		
3 "	11½		
Side seam	1.00		
#402 Can side	2.00		

203 Can bottom	2 cents		100
Draw ——	4		
Trim	4		
A cover	3½		
C Unwire	3 1/4		

Cover group C

[illegible] – assembly Cut	15 cents	100
Chain	15	
A wire	2 1/2	
B Uniwire	2 1/2	
[illegible]	15	
[illegible]	15	
[illegible]	9	

Cut Pieces

Cut blank	2 cents
1st Draw	4
2nd "	4
Trim	4
Size	4
Aeree	4
A wire	2 1/2
Uniwire	2 1/2
Draw Eylet	5 1/4
Bellmouth Eylet	5 1/4
Mark plus	4

106 –

Stuffing box 107

A wore 3 cents 100
C unwore 3 1/4

~~Rod connection~~

Gland –

Coil Cut in rings Bend
4A wore 4B Plate 4C unwore

Valve box

A wore 3 1/4 100
C Unwore 3 1/4
flutter Valve seat 4C

Separator Valve set

Form
Burr
A wore 1 1/2
C Unwore 1 1/2
Swedge 4 1/2

Seperator Top

Drill 2 small holes	25	per 100
Countersink	3c	
A wire	3 1/4	
C Unwire	3 1/4	

Baffle

Blank	1 1/2
Punchholes	2 1/2
Form	2 1/2
A wire	2 1/2
C Unwire	2 1/2

Baffle spring

Screen

Shear

Blank	2 c
A wire	3 1/4
C Unwire	3 1/4

Screen spring

Coil

Cut to size

A wire

C wire

Filler Body

A wire 3 1/4

C wire. 3 1/4

Lever band group

Assemble 9 c

Notch 8 c

100

Hinge band

Blank 1 1/2

Ream

1st Draw 3 1/4

Flatten 2 1/2

Pierce 5 5/8

2nd Draw 5 5/8

Trim 5 5/8

3rd Draw 5 5/8

Stop Notch 5 5/8

Ream holes	5	
Countersunk		
~~B~~ a wire	3 1/4	
C unwire	3 1/4	
Lid lever		
Blank	1 5/8	per 100
Pierce	2 1/2	
1st bend	2 1/2	
2nd "	4	
Chip	1-5/8	
Ream Countersunk	8	
wire	3 1/4	
unwire	3 1/4	
lever pins -		
Cut to length		
wire		
unwire		
Lid assemble	9	
Close	3 1/4	

Lid Cap		
Blank	1 1/4	100
Draw	3 1/2	
wire	3 1/4	
unwire	3 1/4	
Lid plate		
Blank	1 5/8	
Pierce	4	
Stamp	2 1/2	
Ream Counter	5	
wire	3 1/4	
unwire	3 1/4	
Lid Bottom		
Cut + Draw	1 5/8	
Reduce	5 5/8	
Trim	1 5/8	
1st flatten	4 1/4	
2nd "	2 1/8	
wire	3 1/4	
unwire	3 1/4	

Hinge Cutter
Wire 1 1/2
Unwire 1 1/2

Hinge Spring
Cut to length
Wire 1 1/2
Unwire 1 1/2

Nickel plate,
Stamp grid
Set in pockets 35 c 100
Roll 5
1st press 15
2nd " 15

Grid
Shear stock 2 3/4
Blank & pierce 6

Wire 3 1/4
Unwire 3 1/4

Nickel Rocket group
Filling inside cups
Assemble #141 + #142
Close
Remove
Inspect
Roll
Size
Inside Cups
Reel stock
Perforate
Flatten
Press into cups
A put in rack .10 load
B Plate
C remove from rack .04 "
Anneal
Put in holder for f. mch. .12 1/2 "

Outside Cups.

Reel stock		
Perforate		
Flatten		
Press into cups		
A put in rack	.10	load
B plate		
C remove from rack	.04	"
Anneal		
Put in holder for f. mch.	.12½	100

Nickel Powder

Positive Pole Group

Assemble		
A wire	.03¼	"
B plate		
C unwire	.03¼	"
Re-thread		

Positive Pole

Mill head	.75	100
Drill		
Ream	.75	100
Burr		
Re-thread		
Grind taper		

Positive Connecting Rod

Forming + thread	.35	"
Thread one end	.15	"
File to guage	.35	"
" " "	.45	"
" " "	.55	"

Spacing Washers .375"

Form		
Countersink	.12	1000
Grind one side	.16	"
Face to size	.10	100
Grind	.16	1000
A. wire	.01½	100

B. plate

C. unwire .01½ 100

Anneal

Spacing Washers .310"

Form

Countersink .12 1000

Grind one side .16 "

Face to size .10 100

Grind .16 1000

Wire .01 ½ 100

Plate

Unwire .01 ½ 100

Anneal

Spacing Washers .128"

Form

Countersink .12 1000

Grind one side .16 "

Face to size .10 100

Grind .16 1000

Wire .01 ½ 100

Plate		
Wire	.01 1/2	100
Anneal		
Spacing Washers .243"		
Form		
Countersink	.12	1000
Grind one side	.16	"
Face to side	.10	100
Grind	.16	1000
Wire	.01 1/2	100
Plate		
Unwire	.01 1/2	100
Anneal		
Spacing Washers .180"		
Form		
Countersink	.12	1000
Grind one side	.16	"
Face to side	.10	100
Grind	.16	1000
Wire	.01 1/2	100
Plate		

Brotherhood Cloth

Rubber	12 lbs
Reclaimed R	25 "
Chalk	25
Litharge	12
Sulphur	1 3
Pitch	

Tire formula

Rubber	12 lbs
Reclaimed	25
Chalk	25
Litharge	4
Sulphur	3
Lime	1/2
Zinc Ox	5 lbs

Reclaimed 13c Pre cons

Unwire	.01 1/2	100
Anneal		

Spacing Washers .113"

Form		
Countersink	.12	1000
Grind one side	.16	"
Face to size	.10	100
Grind	.16	1000
Wire	.01 1/2	100
Plate		
Unwire	.01 1/2	100
Anneal		

Split Washer

Blank	.02 1/2	100
Flatten	.01 7/8	"
Split	.01 7/8	"
Tumble		
Spring tempered		
A. wire	.01 1/2	100
B. plate		
C. unwire	.01 1/2	"

Clamp Nut		
Blank	.05	1000
Flatten	.06½	"
Tumble		
Drill		
Tap	.10	100
Burr		
a wire	.01½	100
B plate		
C unwire	.01½	100
Clamp Nut Insulator		
Treat		
Pole Nut		
Form		
Tap		
Grind		
a wire	.01½	100
B plate		
C unwire	.01½	100
Negative Group		
Assemble		

Iron Plate Group

Stamp in grid		
Set in pockets	.40	100
Roll	.105	"
1st press	.15	"
2nd "	.15	"

Iron Pocket Group

Filling inside cups
Assemble #141 + 142
Close
Remove
Inspect
Roll
Sige

Iron Powder

Negative Pole

Mill head	.75	100
(Drill		)
(Ream	.75	")
(Burr		)

Rethread
Grind

Negative Connecting Rod

Forming + Thread	.35	100
Thread one end	.15	"
File to gauge	.35	"
" " "	.45	"
" " "	.55	"

Pocket Insulators
Treat.

Plate Insulators
Treat

Bottom Insulator
Treat

Side Insulator
Treat

Cell Connector Group		
Assemble		
Solder		
Plate	.03	100
Swedge	.06	"
Bend	.09	"
Connecting Wire		
Cut to length	.02	"
Straighten	.02	"
Cut thread	.13	"
Tin ends		
Connecting Lugs		
Pickle		
Tumble		
Rough ream	.85	100
Drill + Face	.85	"
Face	.10	"
Drill for Tap	.40	"
Tap	.08	"
Ream	.50	"

a. wire	.02½	100
To plate		
& unwire	.02½	"
Anneal		

Terminal Group

Assemble
Solder
Wind with tape

Terminal wire

Cut to length
Clean each end
Tin

Terminal Lugs

Pickle
Tumble

Drill & Face	.85	100
Face	.10	"
Rough ream	.85	"
Drill	.40	"

Beam	.50	100
Wire	.02 1/2	"
Plate		
Unwire	.02 1/2	"
Anneal		

Separator Top Gasket
Treat

Negative Pole Group
Assemble .03 1/4 100
Plate .03 1/4 "
Re-check

all

Yet sale to date
orders on hand
Stock on hand Cells
Payroll + rate
Water Oil - Coal
Supplies all kinds
Carting. gas.
Cyanide
Nickel anodes
Incandst Lamps
Autos, repairs
Packing — Crating
Coat Trays —

Rubber Machinery

Wm R Thorp
Trenton

16 Dia 27 face Washer
Crocker $675 =
HP. 20-

Grinder Mixer & warmer combined
the same machine, steam
heated cylinder

16X42 — $650,

Hydraulic press —
15X15 — 8" dia Ram
2000 lbs per sq inch on
that compound —

Vulcanizer. 4 ft - 8 ft long dia
~~Cost~~ abt 300 t. 400 dollars
without Cars $95 each Car
2 cars

Callendar 2 ft length
3 Rolls 14400 Chilled
14" dia -

157 · 2.68
139 11 98
228 211 00
98
622 225.66
225
897

12)1393(116
12
19
12
73

2703
31
5109

3)1393
464

5)1393
278

6)1393
232

8)1393
174

11)1393(12
11
39
33

1	13.93
2	6.96
3	4.64
4	3.45
5	2.78
6	2.32
7	1.99
8	1.74
9	1.55
10	1.39
11	1.27
12	1.16

474
174
528
600.
1400
1200
2
1400

3684
528
360
350
4922

600 / 4922 / 8.20
4800
1200

8.20
1.50
50

Experiments on Lansdown Terrace

Board, Lard knife, Trousers, Cloth, flat, Fish scales – Tree stump

Motor 64 – 56 56 56

Motor got warm and when reading Tube

pumped Tires hard

& Read fish scales

34 35 35

Oiled axles & put chain back

had change distance bars

Road Cylinder oil

38 42 44

Stock and chain – 42 46 50 49 48

Ran out in yard & Gouch

44 46

Running Watching Ave

Level – good road

1st Match Amperes 33-37-40-42

2nd Match 47-52-52-

Coming back 33-29-27

3rd Match 47-48-53.

Coming back 37-33-30- } 41

4th Match 60-64-68

Coming back 54-47-44

Coming up Aldens St Hill –

3rd Match 66-72-74-75

4th Match – 86 88 92-92

4th Speed worse feeling than

Runabouts – 3rd speed very much

slower

If 21000 bbls work all ground
Cost 44.3 but no grinding 5c
for Extra Labor + Coal wear etc
49.3 per bbl

Coal Kilns Burn 6666 235
" Power 73 lime 2.65 194
430
397 men, 196 Boys, 777
Jaws, Burs, Fire Bars Tuyeres 37
Repairs Stacks Thimbles
Blacksmith 20 18
Rollers 10
Belt Stacks 15
Chute wear 10
Worm belts 6
Burning Kilns + 20
Rotary Silo + Stops 7
Roll Stoppers 27
Gypsum 77
Screen Stoppers 60
Slightly 3
Screw Conv 5
Worm roll plates 30 308
General Exp 37

$1552.

22000 Crushed at 550
1210

$342. day
or
2-2 ovens abt 10000 per month Tied up in blinkers
30000 bbls clinker blocked per month.

Invoices Phila. up to April may journ.	22 853
" Wilks up to journ.	34 388
Indeac notes due prior to Nov	55 739
Pay roll to July 20	16 000
Unfilled orders 7/16 –	9 296
	138 276 –

of open accts – 30 000 of clay to put in notes,
55 000 of pending notes, can be extended by
giving 30% of extended –

FeOH. removes chromate
HgO. apparently removes
Ferrid Cy
HgO dont remove Chromate
MgOH removes Ferrid Cy
Lime OH " "
Millon partially " "
$BaCO_3$ " "
MgOH dont remove Cr
Millon apparently removes Van
Bi OH dont remove Cr
Millon dont remove Cr
$BaCO_3$ dont remove Cr

12 cells 24 hours per
HP – 24 hours,

400 cells 32 HP 24 hours
18 clay 800 lbs 2½c lb for [illegible]
2 cents for [illegible] 4½
Labor 2c Total 6½c

64
24
256
32
20
640
3200 –
5000 [illegible]

800 lbs
300
2400
1800
2.25

144
288
432

432) 2743 cups (6
2592

Rafu

~~3 ft~~

3½ ft long 1 ft wide

2 V 140 amp
1600 ft strip – 280 watts.
6 cells 24 hours ½ HP –
84 ft.

24
3½
120
72
84

1
1
12
148
7) 1600

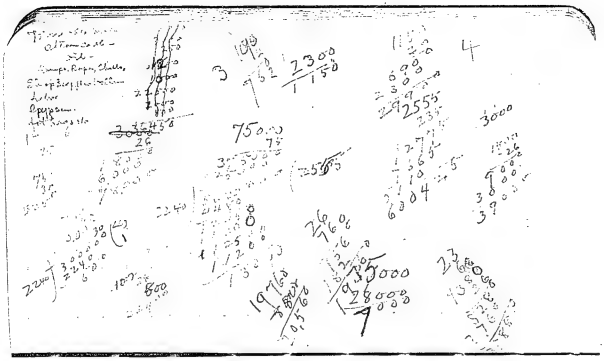
140
2
280

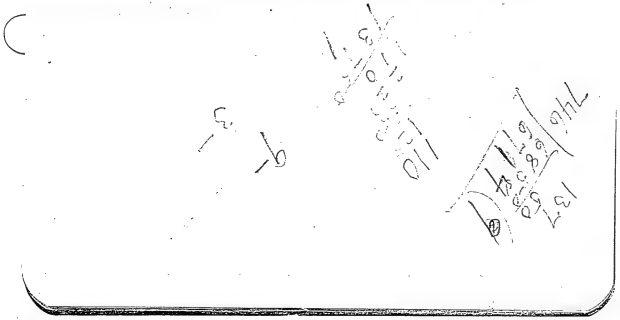
1600
12
3200
1600
19200 –
7) 19200
2743

K Manganate is very sol in
Alkalis without change
Alkaline Sol has great tendency
to produce with certain oxides
precips which settle rapidly
+ are constant in composition
The Sol is also a powerful
oxidizer & certain compounds
are oxidized at ord temps whilst
permang K requires heat
+ large excess, lastly the
End of the reaction is
sharply defined green
Color disappears + Sol is
Colorless = To make
add (2 mol) KOH in a
Crucible some H_2O added &
finely ground permanganate
K. (2 mol) gradually
added with constant stirring
+ heating after 2 hours

fusion and then crucible
cooled + whole placed in
well stopped bottle to prevent
access air + organic matter

Cobalt in KOH is poly bad
as it forms high + low oxides
whereas Ni short + is most





165

125
42
250
500
225

746) 5250 (35
26250
15750
18875

5250
50
2625
60
746) 15750
14920
829

746) 15750
1492
436
746
8

1837 (14
102
746
356

746) 1505 (2
746
759

(746
2011

1505
60
903
436
47

43
35
215
129
1505

750)

200

24
6
144
200
2800
210
2800
5760
604
446
158
2500 (12
2500
00

2200
30000 (20
150)
446) 5760 (13
446
1300

135 (66
66
675

67 50

135
17
945
135
2295

14
23
50
115

~~950~~

24" lever moves 628
850 Rev motor
weight on end lever to
start wheels rolls
1 lb 7 oz

at full speed end lever goes
5338 ft minutes. which at
1.44 lbs to 7686 lbs pull
this is less than 1/4 HP to
start.

64 lbs to move Lundeen on
floor -

7686 | 33000 (43
744 | 30744
22560

Mats, pres't V.L.

Firestone Tire Co
N.Y. City
Broadway near 58 st

12 Wilkeshaw 131 Rec —

42 827

Lansden Journeman

		amp
Motor only	1 notch	9
	2	9
	3	8.5
	4	13
Motor & jackshaft	1st notch	13
	2	13
	3	14
	4	23
Motor, jackshaft & wheels	1st	15
	2	15
	3	15
	4	23

45

62

72

12.8

150.00

281.50

225

384 –

225

16

2

47 48

41 amp –

[ITEM FOUND IN BOOK]

EDISON STORAGE BATTERY CO. GLEN RIDGE, N.J.

LABOR AND MATERIAL

WEEK ENDING JULY 13,1904

	Labor	Material
Executive,Engineering,&c.	$157.08	$ 2.68
Office	139.22	11.98
Selling Dept.	84.62	26.00
Manufacturing Dept.	1393.19	883.01
Testing Dept.	78.93	3.63
Packing,Shipping & Store room	71.22	
Repairs & General Maintenance	228.72	211.42
General shop gang	98.01	
Power	60.33	122.95 Coal 18.92
Freight & trucking	13.90	59.21 DLW
Supplies for tool room		4.20
New Construction	18.15	64.36
New Machinery & Tools	360.13	656.51
Fire protection		12.60
Interest & Discount		1.88
Total	$2703.50	$2079.35
	$4782.85	

1098.00
3684.85

360
6.13
92 614) 3684.6
1098 3684

[ITEM FOUND IN BOOK]

For a charged tube placed electrically in [illegible] with good charge of SiO_2 & some [illegible] Fluoride [illegible] without [illegible] Then change [illegible] Experiment [illegible] also filling changed [illegible] then [illegible]

		[illegible]	[illegible]	[illegible]		2nd 150 [illegible]	3rd 3 [illegible]
2K	2166						
	2165						
	2164						
[illegible]	2153	3108	1132	[illegible]	1057		853
"	2154	3107	1085	[illegible]	1104		807
K_2SiO_3	2153	3106	1077	[illegible]	991		857
"	2152	3105	1040	[illegible]	1041		857
KHF_2	2151	3104	117	[illegible]	810		577
"	2150	3103	183	[illegible]	187		220
K_2TiO_3	2147	3102	1037	[illegible]	1038		857
"	2148	3024	1085	[illegible]	1032		870
K_2MnO_4	2147	2023	833	[illegible]	950		860
"	2146	3020	[illegible]	[illegible]	1010		503
K_2CrO_4	2168	3119	717	[illegible]	1183		770
CuO_2	2165	3118	1126	[illegible]	1043		573
"	2164	3117	987	[illegible]	987		863
KI	2163	3116	1172	[illegible]	1052		867
"	2162	3115	1247	[illegible]	1147		837
NH_4NO_3	2161	3114	87	[illegible]	98		93
"	2160	3113	33	[illegible]	56		55
$K_2Cr_2O_7$	2159	3112	520	[illegible]	1043		572
"	2158	3111	280	[illegible]	183		63
K_2MnO_4	2157	3110	810	[illegible]	1177		726
"	2156	3109	113	[illegible]	1066		772

Reg Mass.

[ITEM FOUND IN BOOK]

Ni's changed in the special electrolyte &
[illegible] [illegible] with good charged Fe & run
in fresh 1% KOH without [illegible] change.
[illegible] [illegible] all as found [illegible] [illegible] good [illegible]
[illegible] [illegible] as sampling.

Ed	cell #	To .5V	A.V.	2nd R. 24 hour chg Chng & Rest 900	3rd 33/4 hour chg 950
2155	3108	1038	[illegible]63	1326	883
2154	3107	1108	1001	1246	905
2153	3106	1133	992	1340	925
2152	3105	1153	833	1303	860
2151	3104	[illegible]	336	1353	900
2150	3103	1080	466	1443	883
2149	3102	1130	1083	1312	933
2148	3024	1111	843	1206	907
2147	3023	1253	1116	1250	867
2146	3020	940	503	1263	933
2166	3119	1150	1013	1207	900
2165	3118	1110	787	1320	933
2164	3117	1133	760	1243	900
2163	3116	1047	[illegible]17	1153	900
2162	3115	473	[illegible]13	533	450
2161	3114	1157	[illegible]47	1327	933
2160	3113	53	[illegible]17	1387	860
2159	3112	1133	[illegible]23	1137	900
2158	3111	1320	30	1273	900
2157	3110	1217	[illegible]0	1367	860
2156	3109	1317	[illegible]83	1293	930

Reg generally gives 1200 to .50

Notebook, PN-05-02-07

This pocket notebook was used by Edison during the period November 1904-February 1905 for notes on experimental work and for lists of tasks to be performed. Many of the proposed experiments pertain to the chemical composition, construction, and charge and discharge conditions of storage batteries. Included are entries describing groups of test cells, some with nickel flake elements in their electrodes. There is also a note by Edison reminding himself to see Frank L. Dyer about filing a patent application on the nickel flake. Among the employees mentioned in relation to individual experiments are Ralph Arbogast, Jonas W. Aylsworth, and Walter E. Holland. The pages are unnumbered. Approximately 50 pages have been used.

1000 000 -

3600 | 100 000 - (27
72 00
28,000

3600
20
72,000

Precip with 90% Ni.
10% of following
Wash Hcl extract KOH
then fuse in solid KOH
to dehydrate
Bi Mn Fe Mg Al Zn
Co Cu Ag Pb & in fact all
the metals — 604 —

Also with 90% Hydrate
Ni add 10% of Hydrate
of other metals giving
up + oxide to Ni(OH)3
Reduce with various
reducers & by graffe
604 —

Soak Dehydrated
Ni OH both by fusion
KOH + by metals ignited
produced with
all the metals & precip
whole in Dimethylamine
to get a OH from the
amphoteric Ni.

Chloride Ni dissolved
in Ether, or non water solvent
& then heated with metallic
Sodium to get Ni O —

Perhaps Ni (OH) 2
formed in acid
Sol will be different
~~colour~~ from those given
by KOH —

Perhaps base of
Mauvine or other
organic base
precip Ni (OH) 2 —

Distill Cannabis
& Lanolin with
Chl Zinc mixture
get high BP
Hydrocarbon

Get some Sludge a
Bull S & dif
asphalts, Texas
Canada / Lima
& California petroleum
distillate —

~~Jumpers in No 4~~
~~also large hole~~
~~[illegible]~~

What is voltage between
2 nickel strips alone
in KOH, Charging

also Get No Cup +
Nickel also 70 Cup +
No strip

~~Daily make enough~~
~~glass Ball Valve all~~
~~open centers~~
~~John all Cobalt Bore~~
~~Separator Cup~~
~~Put in all centers~~
~~& get results~~

~~Ditto Silvered Connecting~~
~~& No 4 Jumpers~~

~~Try Reversing an individually~~

~~Try an original good cell which by long running has gone down again by addition of H_2O_2 to ·01 Solution & see if it shows Course any~~

Chg voltage between 2 plain Ni strips 2.02 about depdg on rate
300 Rate

Chg voltage bet Ni pocket and plain Ni strip 1.76 at 350 rate.
Ni pocket fully charged —
Chg voltage bet from pocket & plain Ni strip 180 at 350 rate, Fe fully charged.

Ni pocket Ni strip 150 Rate = 50 rate	·42 74	Volt chg
Fe pocket Ni strip 150 rate at 50 rate	·108 66	Volt chg

Above cell was discharged to ·50, & then put on at 150 rate,

2 Ni strips at 150 rate 50 70	230 219 230	volt chg

1 model H 18
2 " H 27
3 " H 36
4 " H 45
~~5 new gas vent non slop~~
6 supply varnish - gallon cans
~~7 4 Plating machines~~
~~8 Fit Boiler house~~
~~9 Automobile shed~~
10 Skylights new assembling room
~~11 Seam welding machine~~
12 supply electric water filters
13 Block moulators E 18
14 " " E 27
15 " " E 45
17 " " H 18
18 " " H 27
19 " " H 36
20 " " H 45
~~21 stop bulging cans outward~~
~~22 Test new Pittsburgh stock~~
~~23 Weld cement cable~~
~~24 Shims for cement rolls~~
25 Can Tools H cells
26 supply lead glass tools
27 filtering KOH oiled Maquette

28 Overfoaming cells
29 Fix up Auto batteries
30 ~~New Cement cable single splice~~
31 Insert wires motor flexibles
32 " " Gandy belts
33 ~~Get sheet rubber from Amer Hr Co~~
34 Hester charge Pum Am To Electric
35 How about anode furnace.
36 ~~Test Stirr & Studebker battery~~
37 ~~Get Johns welding Mr. [illegible]~~
38 ~~Ask Fleo about Adams new battery~~
39 " Pon about " " Sloanes.
40 ~~Hurry up Iron reduction pots~~
41 " ~~Annealing~~ "
42 ~~When annual set up new chalkings up~~
43 Hester Belt Con design replace Elec 2
44 " 3rd fine grinder etc
45 " Increase coal grinding
46 Randolph send check Jutulong
47 Drawings H Trays for nat sylfreda
48 ~~Changing present E Trays~~
49 ~~New gloss side Ni filler~~
50 " " Ni filling machine
51 " Ni Crimp die
52 ~~Although new defects cell run before use~~
53 ~~How vibration Ni plating of grames~~

54 Barnes varnish trays
55 Buttons for holding Top Cells
56 Jig drill for buttons,
57 ~~15 & 27 for Landen~~
58 ~~Old Baker get in order~~
59 ~~Mud guards Landen~~
60 Fix switches at stable
61 weld strips for plating
62 " pieces in Top Cover Jrshold
63 ~~Jrshields new welder~~
64 " design side seam weld
65 ~~Skylights assembling room.~~
66 Cost producing Ni Fe etc Silver
67 Ralph long strip plater —
68 Station Cell 3 high 3 wide
69 Fix changing at Barn
70 New Jubber for Ni filler —
71 Ralph Test Cell Rubber chips
72 Gus man change Test Cell (not Cell)
73 ~~Cost Production of Ni Hydr~~
74 Complete outfit Nickel finishing
75 Change Cement standards
76 ~~Test Stations Stop for Lunch~~
77 Make Nickel flake
78 ~~Nickel Solu. not put on [illegible]~~
79 Sig att 5:32 Up-up Eng Cement Foby
80 Glass balls broken!

Nov 4th –

1 = Make Chip to hold single particle NaOH water flows + KOH, to water changes to NO_2 which changing under Micros OK hid (at 1/2 pts.)

Put out some pocket print slip on – from Gibbs, Boiling 2 in 20% 2 in 5% 2 in water Changing KOH unconsciously boiling 3 hours actual boiling – 2 do nothing with Change 15 hours 100 – dense –

Mem. Dr Brinsham boiling Was required equal put back Crossed body pressed Stuff came out from Illen to Cam + thread to thi – Burnt holes in Cornea Rubber nerve treated

Also in 2 lb 6 oz jerked tit on

Make Cup 6% Bi NaOH no graft 15 hours.

Little Reg No
change 15 developer
+ Keep this up for several
days. Use 10 oz of chem
all in one jar,

Make up Gibbs cell 6 x 8 plate
put in Kettle + Keep 175°
for 48 hours, 20% KOH,
Change Solution every 12 hours

Finger mark 8 x 2 flake
Moderate, 150 Cor -
Soaken strong Hypo - before
running off

Feby 7 1905

Try reversing old pocket 24 hours
then Bromine water to Eat iron
out or not touch nickel or
dont think Br will hurt metallic
Mg if tipped when Fe all gone
could find this out by nothing
with Br on metallic iron flakes

Get drawings of Cleveland
Lumber Mfgrs.
get some pure glycerine, also
Grape sugar, Rosin.
Caramel

Make some Mg flake Coated
Silver on bath besides -

Ralph. 72 tests
6 8 10 12 & 15 of
Mg

Reverse cyn iron + put
out all cyn By Prussian
see how it reacts —

See if iron can get out
Iron many No Hg
Except HgCy +
N. Strip, Chg to thin
take out & weigh

Chloride Iron
pass H over + Volatilize
as HCl, absorb — Weigh —
tell Ralph —

Oxychloride Hg
Chunk HgCl decompose
Lot of Hg drops
Thy wanted after
drying — swallow in pocket

Could regulate Chg current
+ well to get proper
porosity

Chloride Hg, Valdize
— open Chg tube
moistened gold — Can I
be reduced Cry H. to
get flake —

Precip HgOH, pour NaSO4 +
specs NaOH (boiled) —
then squirt out still alcohol
then pour in Cuprex. let
dry then press + Compact
then wash out water
till SO4 free. then Cake
no grap —
also powder Coat Hg flake
moisten — press + weigh
press + recompute —

Antimonic Ni thin plates
press 2 at Ni 1 at 56 –
Well 316 a fine –

6% Bi op with Ni –
wear proofs weighing
dried – powdered – 8 & 2
flakes not [illegible]
2 Cupro one gram
175 Cromo – 0.003 flake

ditto 9% –

Messrs 0.2 breaked
to pump by then
Rich by H + use Hg –

See J Gubkin
Annal Phys + Chem [2]
32 – p 114 Recherch

making films
Edward C Bacque 1898
p 101 Sup Comment
[illegible] from surface of
a [illegible] of [illegible]
on glass [illegible] of given
film – Ag & Pt film –
7 x 9 Ni – 1 Wartman –

Basic Mercuric Salicylate
Sodium Hott with [illegible]
in pp by acids including 1.0 z

Layout Pharm Chem 1903
VII 17 – 412 416

Ni Reduced by H
then thin cup. thin Hott
weaker [illegible] or formaldehyde
current.

Fungus in - malpiece.
Mr folium 0002
0003
0004
0005

Oxide Ni in Cup pressed & colorless Reduced by H, then MgOH, 40% ni by Soaking

Flotation Results - 8 & 2
Grid premium Nickeline
2 1/2 9 2 1 3/4 1 1/2
1 1/4 grinding. Concentrate both water fo and mix
Try both ways -

Cup in grid with powdered K Sulfate proper weight powdered then Compact Boring. then dropped out but left side of 2nd force in the Off
Mush + close hole

Cup with powdered (Dehydrated) Sulfate Ni Compact then suspend in MgOH-gas - dilute another in KOH, also Alcohol with KOH, if well loosened held to Sulfate. Sulfate K etc

New Idea -
Parchment Cup electrode in Cu Fe KOH, Ferro Cup K - etc.
Concentration of Ferro of inside parchment and depolarizer -

Possibly KOH saturated Ferro + parchment
Cup Solid Ferro.

Mixture of Calc Mg SO4 2
dust disposes of electrolyte
phenolsoys make slippery

Molasses Flake Mg -
Nimine 10 days
after final corrugated -

Phen Mg OH. 1 75 gm
Mrs 150 mesh -
10 days nimine -
dettle Drop - through
200 mesh - 10 days
Nimine -

flake graf 1000
with Sulphate K
1 ½ gram - Corrug
then dissolve out
then dip 20 tons Nimine

Make Chlorat powder
powder Mg OH 2 200
paste into Cargo see of
Corrugate -

Pp Sul Mg Green Mg OH, heat
then dry hydrate -
powder & use in cargo
Soak out K SO4
dettes Molasses v Flake Mg -

Oxalate Mg - 2 gram
boil in Mg OH, then dry
& Recorrugate -
Phos Ammonium Borate
Chloride 1

Thurgrid Ni Red by
H - KCy in KOH.
acc of get acetone -

Ni amalgam sponge
wet by pressure - acc of
get acetone -

Ny group Bromide
K in KOH -

group grids soaked
Very strong KBr for
24 hours then put
in KOH & chge immediately

Charge a group
+ discharge in 33%
till it shows 60%
@ 7.00 - after discharge
~~Charge a Group~~

Leave KOH in ~~Sog~~
~~Soakers till goes~~
~~Hot out~~, dry in dry
take out powder +
put in new Cupro
Comm Reg - Run in
21 % mag as Ni203
Combine KOH Electrolyte
This alone renders well &
gives good porosity -

also Oxalate Ni also
Comb Ni is so light -
separate Comb - make 1 gram
Cups High separate by H
in Cups & Non-fill pores
by allowing soak in
NaOH - KOH or Nitrine.

also powdered Comb Ni
Red by H, or Hempat
in Cups & heat to
fill pores - 33% -

Will Carb Ni peroxide
be decomp'd by Hydrog
Ammonia — heat,

~~Precip. Ni from Sol'n~~

Set up in Precision room
Jar & strips to make $NiOH$
by alternating Current
Look that my chemist
patent & that see if
Camfield the battery
he gave me — get copy
that patent.

Suppose Carb Ni is
acted on by Ba Hydroxide
will it go thereby
suppose Ba Hydr dilute,

Try & work up Electro
Metallurgy using $Ni(O_2)$
that flocks & form
coherent made stronger
must be slightly
alkaline,

See if it is possible to
make flocks sulfide Ni
by acting on Ni flocks
by H_2S dry or that
it may be that there is
too great a drop out
$Ni(O)_2$ & a partial to get
secondary action &
therefore insoluble hydr
Resolution flocks —

Possibly Ni film Cond'd
be partly changed to
a Nitroxide they dell
Conduct E.

Examine those not on
Endurance of Cups
plated Cd Cu Fe &c.
Aq —

Write Gen Whitney get
$0.02^{\frac{1}{2}}$ strip right
width ~~[illegible]~~ measure
also data price Etc

as Ferro + Ferric Cy of
Mg - Bi decomposed
Ca - by KOH ferrous
could be used as cathode

Ferri of Fe organic -

Put highly polished
Ni strips in KOH
100 cc containing 5 grms
Aluminum -
dilute 3 grms KI
Note what current
does to surface -

As Vanadium kills Fe
by depositing probably
Calper or Ni flakes
Could be deposited now
by Va which is a
conductor (?) the more
a Di ox dat comes
the metal dont deposit

Try purchased Ni strip
a Vd 50 uf from see
results

Va plate rolled lengthwise
both ways for making flake
~~[illegible]~~ to plate well
not be fed

Investigate a high Cap
33% chrome Ni
without soaking much
KOH not to see
if still lumpy dont
dry too much if any

A group chg on 21
dis on 33 / 0 —

another chg + dis
twice on 21 & dis 33
once —

be sure mixture a
group with Ammonia
solid — with + without
graffle —

Chg + dis then chg
on 21 a group
+ then chg with
KOH on + [illegible] warm
+ put in new Cups

ditto get all KOH
out —

ditto [illegible] KOH in
not do & dis chg 2 [illegible]

ditto wash out in alcohol

ditto chg + dis 33 —
wash out in alcohol &
put new Cups —

ditto chg dis a chg 33
wash out alcohol —

Chg + dis 21 wash out
all KOH by alcohol +
rerun without putting
in new Cups —

ditto chg dis + chg

ditto 33 % chg + dis

ditto 33 % chg dis + C

ditto 6 % B1 in MOH
chg + dis, wash alc
& put new Cups

ditto chg dis + chg + al
new Cups —

Boil in KOH 5% old
26 Cell Cups. See if got
radicles in — also
soak alcohol warm dis-
-ut KOH remove mint
very carefully — weigh &
put in new Cups.

Save cup & put new ones
in old Cups.

Chg in 21 wait 24 hours
drain chg. then change
night & morning — wait
after morning chg 24 hours
then to new KOH
soak in.

Run a Cover on
Mouldering Cuts
Hodges do it
Compare with very

Make fuchs
6 grams Na OH.
to get liquid glucosan
also one with 10 grams
Hodges special cups.

Make fuchs Na solution
to grams Cake group —
get liquid glucose
Hodges special cups

Make fuchs 2 grams Na fluoride —
SP 100 Cor 150 then soak —

group 2 cups on gr.
Reg. quest to Warren
to chg. to 33 1/3 for
Cell Cuts —

Acetate Ni dissolved in
dilute acid, then
Chlorine to peroxidize Ni
or then KOH & then perox
to get nickel peroxide Ni_2O_3

Only $NiCl_2$ in glacial
acetic a + chlorinate

Make green chrom
green liquor 20 hours
5 gram per liter compar
ace of get greater output
than with 3 —

See Holland about
Endurance of chrom peroxide
get the chg + also off
if he gives me most
to see of chg off —

Electrolytic Nickel
Separated by Hypo
or Chlorinate —

Some green NiOH by
precip sulphate so there
is always 33% excess
of KOH when fully pp —
put Sulfate in 40% in
ammel solution, when it
gets to 33 free KOH.
add more KOH + go on

Try then pump green
no graf also done
with graf —

3 gram green chg 15 f
hours only 1 2/3
200 m a h over then
Change to 15 f hour
take out 2 hr. then
on 3 chg take ~~about~~
to 75 + run Reg

flake Ni plated
both Iodo Copper
also Silver so
drop Ent by mart.

plate Thorn
not sulph & KOH,
Can use Crude
mix from Monopth.

Ralph dont fail
make enough Cobalt
Red by H for 4
groups —
With + with Hg as
from — + myself
graphite for Ni —

just the thing, Cups
heavy plated with
Cobalt & yielded —
fall Ent OK —

If possible make a group
with pared Magnesium dozz
and dried Ag Cups both
tops & bottom, plain Glass
also Ag mix —

The very Coll.d HgOH
got when zepmly with
NaCl + KOH,
This should be poison
when dried —

Can Metal be
deposited from
Alkaline Solution
with Chrale
possibly in powder

The greater the Nickel surface exposed the crisper the less well to the gas internally when covering where the swell –

Benzol + Rosin to stick flake Ni on –

Alcohol + shellac.

Benzol + Cork (as pitch filler)

Gutta + Benzol (filler)

Run Reg group with large Ni surface outside Cup but connected to it so internal gassing be diminished –

Make a neg rolled wet with Ni

Ralph reduce some Ni low temp from most bulk Ni Compound that holds it shape for Carb.

Try 743. flake Ni wet 5% KOH, rolled –

Temper neg 2 min Mahogany flake Ni through 50 to 100 mesh –

ditto. 80. 120. mesh –

It is probable that Carb Ni acted on by Hypo the OH taking place of Carbonate will still peacock pigeon from Cromell – Tows for only OH – probably Oxalate or other salt which can be Oxidized out by Hypo – should be no free fatty acids in Hypo –

Carb Ni in greed then treat Hypo –

OVH

Dimension-design Cover
from our Shell &
Slewantowlle
important —
Those mean present
growing

Set up 2 thin
sheets .003 wrought
in 21/2 or more
Continuously
see of Dl Hole —

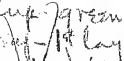
Magnesium Lamp
smooth Rod,
but Tube very thin

Burnish Ni Red by
H-to flake it also
Thro Balls - Vertical &
with Differential
movement Cam for
a Ni Satin gear 200
mesh of [illegible]
same size Red by
H & brilliant flat
or Differential finish
ing

Plate Cop Tough
then Brush with
Ni both sides
also 3 Cop 40000 Ni
Lockside —

Bug Mag[illegible] [illegible] powder
+ burnt for thro
different [illegible] -

Reg Cup green
No [illegible] - 1st layer
green - 2nd of Gold
then layer [illegible] Mag Oy
[illegible] 1/3 then 1/3
green



Mag O above
KOH + give it out
2 green green

See Dyer if he flake
Ni plated, tell him
get jumper plating
Chrolite - also fade
proof split +
Rotaly bell -

Note Benjamin
that Lemon Gow
No alyzdin of the
plated w/ Nickel
+ Tops Cambz Electro
but that is of
Course [illegible] weight

Have Ralph send
up the Cells
& Allen Galvanometer
the balance of
the Bismuth Mott —

See if Cupric ox.
Scales Conductor

Can pass Sulphur
the Ni by passing
Yellow Sulphur K
Electrolysis

Is already by Elec
distilled in Hydrogen
not pyrophoric —

Mosson says the Monoxide
by reduction is green
when cold yellow when
hot & readily absorbs
O & at red heat burns
if heated in air burns
black 350 400, C
at 600 it is reconverted
to monoxide
Says Monoxide forms Violet
Salt with HCl &
Vol 40 C S jul 77

To make Hydrate
from Na-Oxide by
passing dry O over it
which air is warm &

is fired from CO_2 +
Saturated or not with
water V. [illegible] Safer
use Dry [illegible]

Magnesium can be
distilled in Vac
deposited by treatment
Crystals like
Silver

degas of H_2 on the
Aluminum paint
powder & then Eat
away the Al by
KOH - + distill In

Try dif metals
Cu Bi Fe
in yellow sulphide
+ then plate on see
if stripe.

See if aluminum powder
paint will reduce
any Nickel Solution
to replace Al by
Ni.

Possibly Aluminum paint
powder coated by paint
on [illegible] Ni +
then paint on Cr +
reduced by a Nickel
Salt, or plated on
+ Al dissolved out
+ Recommended

Reverse a KCy
(strong) & Hg Cy
grove so no
plate Ni on
graph then
Book out KCy
repeat new Fe &c

find some Ni Salt
that has uniform
Crystal pass 100
Mesh red by H
& Roll out to
foils —

try Aluminum to
bring out 26 cell
book —

The particles of
Nickel for coating
by H & roll
shaped as about
.004 cubes to
roll out 25 to 30 foils
+ .0001 thick —

Plate Cop then Ni
then C & roll out
and something
Eat Copper

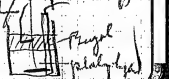
Carbon tissue paper
high temp —
plate with Ni —
burn out in Reduction
furnace & then pass
H without moving it.

ditto charcoal
Carbon high temp
plate with thick
bottom quick, then
burn reduce by
H in situ —

Ditto Brass
Cotton,

possibly plate
Cop with Ni then
reverse 1/10 turn then
plate until 20/1000
thick or less & then
wall would all
seperate — Ni not stick
to oxid Ni —
possibly expose to air
do it — or putting Cylinder
in Hypo for seconds at
Each plating —

possibly a very slightly
Conducting organic
liquid over a plate
by [illegible] Voltage
useful —



Moissan Annal Chim.
[5] 21, 199 225

~~Mn O on the (111) [illegible]~~

Hydrated or Anhy Mn_2O_3
heated 1900 in H
Red to grey Magnetic Ox
at little higher temp
yellow green Mon Ox
this unchanged so no
further change
at 200 C but at 230–240
is reduced to metallic

Mn Monox (this obtained)
green when cold
yellow when hot
it readily absorbs
Ox at ord temp

Make groups in which
Mn Reflexes is spaced
in Cups so it will pack
naturally closed

also group frozen
Hydrates – Turning fork

This irregularity in
Cells may be due
to some jamming may
in (10) feed of fine
medium & many
better at times,

Possibly this jamming
action would be
a good thing too

Reg fellow –

Group growing in water bottles

Group cured in water

Group Wax moulds wet pulp tubes & packed in gauze

Nitrate deposition in from the Carbonyl into Ammonia

Contains a Microscopic Chemical or Brain Tissue paper Carbonyl & Membrane not & not light –

Cylinder of glass hand steel-plate Ni 0001 rupee scraper & scraper off in bath –

Nimine group on a polished cylinder or plate glass – form fulcrum & read by H –

Powder Spirit Person & dope for 7£ –

Magnetic powder & dope –

Split Wheat by Molasses or Rum & Remove it –

Urea unsolved make it tough —

Syrup of Nitrate Ni gradually heat of Varnish film on glass, probably blacks off — Red light —

Varnish of acetate Nickel Dry + Iron heat, ~~or decomp~~ by R light

porously glass greased etc for drying Uranium ~~etc~~ decomp. etc

Squirt Pleumate Ni of Sheamb into Water — decomp — R light

Squirt gelatin Ni into hot or hot oil — R light or may chunk today

Squirt $Co(OH)_2$ into
Sulph Ni –
Squirt jelly like
Carb Ni. into
Oil – water
gradually grows

Reduces $Co(OH)_2$ to
Metallic, then
put Ammonia
into a Ni Solution
& reduce the Ni
to Metallic,
Electrolyte (Mica)

Citrate Ni is jelly
dries to olive green
film.

Perhaps Uranium
put gently thread
& stirring with
ground mica
with hot air
that surface be
Cooled without
Mica adhering
then red by H
heat & deep Mica

Probably a phenol
Cylinder of
Compressed NH_3 or
Could be impure that
Consistence together
Morning off Cold
+ lumbago

Genuine mercury beautiful
film - float on Hg
also grease of Cities
also paraffined glass

Dip a 20 mesh
screen in NH_4Cl
+ dry - Make film
to be R by H

Make 66% Zn
33% Cu amalgam
~~Exp~~ detail the
pbly of Sp. fd crystals
+ be oxford - distilled
in H of oxygen

Perhaps by using
Tin Lead Zinc Cd
Cu Ag + pellets
to form Compound
amalgam it will
not dissolve in
Make a good
phenol Reason
Cylinder by
pressure

Sequent $NiCl_2$ Nickel
with alcohol to set
it.

~~Strong~~ Cobalto cyanide
of Nickel Dark red
when strongly Dryp
gives Bluish Crystalline
Scales —

Green

Ammonia ferrous
Orthophosphate.
true Lamellar
When boiled with KOH
decomposes leaving
ferroso-ferric oxide
at same time preserving
the form of the original
flake —

Ferric Ethyl phosphate
Straw yellow film

Nickel Di Ethyl phosphate
Crystalline in groups
of Lamellae

K & Na Salts of Phthalic a
Crystal in Scales —
what its Salts Scaly
try Ni

Naphthionates is a
Nearly pure flakes

Nickel Bromide Ni
gives Bluish brown
Scales Mem Cl

Nickel Iodide Ni
forms Scales

Nitrite Cu Ammonia

Potassium Cyanide

Nickel Nitrite –
Microscopic tablets

Scales Xanthates –

Look over Xs and Crystal

Sulphonamide Ni
Crystallin powder

Ammonia and dilute
to make Soluble test
to make double
Salt Crystal in
Scales

Ammonia Cuprous
Sulphite, Scales

Ammonia Sulphite
Nickel Crystal pp

Amylsulphonic or
flake Sulph

Methylsulphonic &
dilute

Naphthylsulphonic
Cu Salt, Scales –
other also –

Meta Naphthyl
Sulphonic or
flake, tests

Phenylsulphuron
Iodide of
Sulphophenylic Ac.
Salts of Lithium

Ammonium Sulphuric Ac.
Neutral salt salts
Sodium salts
Co salts Lanthanum -
Cu Tables,
Ni salts Lanthanum -

Ammonium Hypersulphite
Ni Cry powder

Ammonium
Bithionate Ni
Tabular prismatic

Tartrate Green Crystal
powder

Thiancetic Ac
Cu salts Lanthanum
Neutral salts
Lanthanum -

Metabenzoyl Ni
Tables -

Adipic Acid
Nickel S. Scales

Bismuth among Chlorides
25 to 30 grams per litre
Cold least Sat. plate
Bismuth -

to make per ox Electrolyte
use Alkaline Sol of
Nat ~~Sodium Sulphate~~ Cyanide
by Cobalt -
dissolve ox mixture
only slightly soluble
to bar [illegible]

Wormelle
Zeitschr f Chem
(2) VII 67
Ber Chem Ges
C 1 1 109

good
Nickel Cyanide forms
double Cyanides
with organic bases
all highly crystalline
compounds

Nickel by soluble double
Cy N Ba + Sulphate of
base, (10) Nickel comp
for Co (assembly)
work which Ni

The way the Co double salt must
was to make Sulphate Co
this treated with
Barium Carb large excess
& Cyanide prec for precip
until white was converted
into Carbonate of
Barium - this treated
with Quantum
Sulphate gave

The double salt very
deliquescent. Soln/water
it was hot, on cooling
Crystalizes out.

Leland use Cylinder
Zinc + paint with
Bergmann paint was
top & less surface
Local action + Res
just same —

Recently Mosaic
gold Fe sulphide
Tin by heating
with some Hg
Salt Exchange
a form Sulfide
Hg - CuSO4
other flakes Gold

see fig. flake Hg from
old pot will fuse up on
heating if by there —
graphite old.

Ferric from oxalate.
~~Behavior of Ferric~~
~~oxalate compost~~
at 440 Ferrous oxa
alone in 6 hours
Unchanged for 12 hours
at 350 or equals more
in 1 hour of ferrous of
ten hours a mechanic
36 hours —

Thus for Ratio to
get Mechanic more
pyro but fuse

Nunnie Lange
Surface Ket at scale
on Cop + 91 cm
Continuously + put
in water + alcohol
dry -

Copper commenced in
yellow NH_4 Sulfate
with considerable Sulfur
added Coated
Crust of CuS. Easily
Separated from
the metal + easily
+ freely

got from Merck
Na_2Br Na_2I
Scales -

Na_2CuO_2 on NH_3
forms Crystals
by boiling at NH_3
(white Crystals)
by passing persulphate
of Pot or Na
with the ammonia
of NH_3 leaves
Crystalline scales
NA

good

Perhaps deposited
Precipitate washed & dried
off smooth plate

pass dry H_2S over
Anhyd. $CrCl_3$ Ni
from HCl & leave
Sulphide Ni —
ditto Br Ni —
absorb H_2O —
Roasted Red Hot —
pass H_2S over
Surface Nickel
Nickel —

Stir Mica with
Saturated Nitrate
when dry add
more nitric Acid
Enough —

Try put NaCl Anhy
in Conc Hydrochloric Acid

Nickel Oxide
dissolves in
Sodium Pot
Melt on wire
fused in presence
NaCl — Crystalizes
pale yellow Microcrystals
Remains — Nickel
gives dif crystl
[illegible]

$2NiO.K_2O, As_2O_5$

$2NiO\,Na_2O\,As_2O_5$

Green Lemon

Micaceous Lemon

Lifervesc Compt R

110 – 40% 40% –

Syrupy Separate Ni. Melt
blow like soda bubbles
Thin – manipulate –

Called all the acids
in Lab – make Conc
Hot Solution Ni
& Crystalizes –

to obtain Ni salts by
fusion use NiCl
and the alkaline
salt of the acid
with 3x Chloride
Na –

Pyrolysis combine with
Ni salts to give def.
Crystals –

Salts which act
as binders or by
Chemical when
ignited to make
porous Ni Oxide
by Lime –
Formic Ni. binder +
putty –
Monochloroacetic Ni
chlo
Sulfo Vinosum Ni
hinge resembles about
putty but Lilac

Chloro Cromonic
four dont melt.
Phthalic prepared by
Tanning, powder —
Phenol Soap —

Silver deposited on
Silver, selen and platinum
flakes, also Delly
~~Made~~ palladium selen —
Rare metals platinum
drinks groups 7+3

Plate iron with
Vanadium, (P) MO WO
Mate polished iron
emphasized by Steels for
form Vanadate in
see of the Conductor
also Ni-Co + other

Make a 7+3
0002 - flake Ni
Run in Hydrogen
group 7 over fused
prod — Ni flake
Rolled Prog with
water - 7+3 —
also with Prog
KOH rolled —

Treated graphite, rolled
H_2O also KOH,
Edison also make
finger mix all
7+3 —

Prod. [illegible]
the 2nd Ni flake
Coll 3 mesh
grace of Com [illegible]
Capacity —
Warren under Mag
particle laying on
plated Ni Silver
Copper & other
metals also
Carbon — graphite [illegible]

Mix 8+2 of which
2 to, 200 mesh finally
with mesh Ni — dry
thru thr 20 mesh
3+2 Coke

this is the one of particle
discussed thro mix
has nothing to do with it.
also, 8+2 Lather
Magnesia equal —

Spong Ni & Coke gives
nitride — also sulphide
slightly ~~[illegible]~~

weak 2 nickel
Reg mix with nickle
cups coated with
anhydrous Ni_2O_3
by painting with solution
of heating not too
high — also 2
with green —
think anhy Ni_2O_3
to contribute

to ascertain if I can
make Magnesium
Carbo. with chemicals,
250 almost want of
Dark strong HNO_3
& bring to Carbo
Water it is best it

Just make
Mellitate of Hg see
if Cubic pocket Crystal

get several books
Silver foil to
test as of make Silver
for a group

Cont for 2 cells
Cups used in grapes
Molasses - yeast

Whole make bad
of Cobalt 943 group

Oxide Mg & Water chf Mg
as it comp. form combined
also

Chalk - Sr & Ba Carbo
find a accident the base of
which forms Zinc - Pb fo
Cd - Sb
MgO or MH_2O
Bases, Bases - Microcosmic
Salt

Oxide Zn - Mn, Sb.
Cd, Zn dust

40 which gives yield
Red - H, then get in
Group - Sulph - Hydr -
Hydro by Currently

1st Rum Meadows flights
from [illegible]

82 22	293			
82 23	337			
82 24	267			
82 25	217			
82 26	337			

Another Group –
Reg £13. Ni[illegible] Reversed on
a Com 175° ~~@~~ 20 amp
for 24 hours

Another Group 45 hour
Use Regular room no
breakdown —

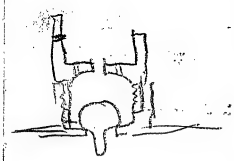
2 more groups as
above but with non
breaked Com that
175° Reversed
24 hours 30 amp
—

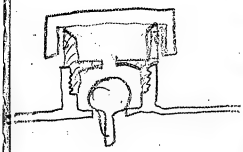
2 more groups
with 75° breaked Rev
+ then Reversed to
Com but not breaked
24 hours 30 amp

Use in above CP
Mached Sheet + Weld

8 | 50 — 10 cells
7

10





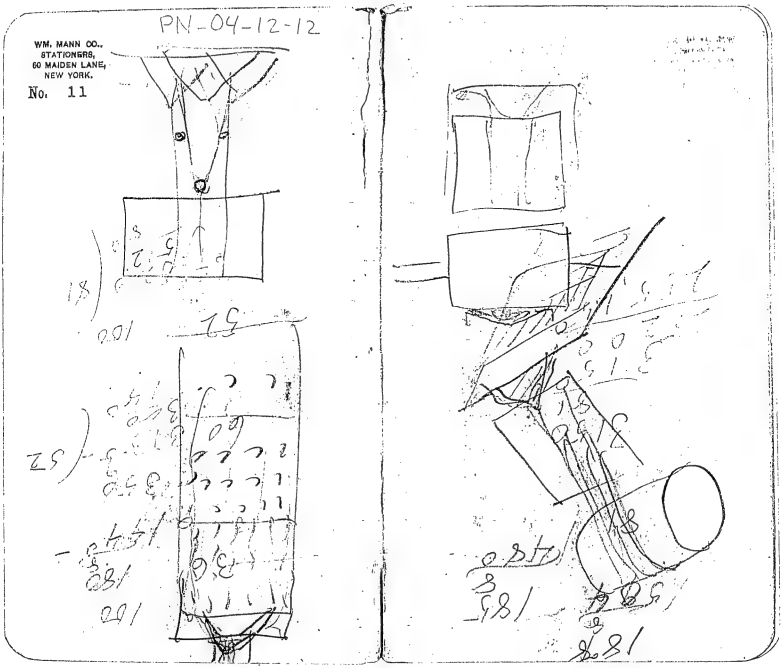
Notebook, PN-04-12-27

This pocket notebook was used by Edison during the period December 1904-March 1905. It contains notes and drawings pertaining to experimental work to be performed and reminders about business and legal matters. Many of the proposed experiments relate to the chemical composition of components for storage batteries and to the construction of groups of test cells. Included are tests regarding the charge and discharge of Edison and Gibbs cells, as well as experiments with nickel flake electrodes. Also included are notes relating to patent questions for Frank L. Dyer; business matters to discuss with William E. Gilmore; a plant operations matter for Emil Herter at the Edison Portland Cement Co. works; and questions about graphite for Edward G. Acheson. The undated entries at the beginning of the book may have been made at the Edison Portland Cement Co. works in Stewartsville, New Jersey. Among the employees mentioned in relation to individual experiments are Jonas W. Aylsworth, Robert A. Bachman, John F. Ott, and O. A. Rogers. The pages are unnumbered. Approximately 70 pages have been used.

PN-04-12-12

WM. MANN CO.,
STATIONERS,
60 MAIDEN LANE,
NEW YORK.

No. 11



Must have generator
making battery ground
[illegible] Cutbow
[illegible] for Motors

Big springs on top for
[illegible] Brushes
[illegible]
Noise players —

Blower in Dryer No
Oiling device —
Gear Casing Vibrates
too much — too
much noise
Rotten — Motor too big
[illegible]

Dust chamber Water
drawing 101 should have
outside air if possible -
or ventilator put in
somehow

Fan Water on fan at
Dryer gives sudden
thump, do not due
to any belt slipping
but some obstacle
or gear clumping

How about the hole in end of Motor where chain is — notice fan at dryer has hole open No 101 Motor is closed by Rubber to the fan Ventilator When motor is used should be closed permanently & when Ventilator is should be used open —

Slowing down box is no good except for a block etc anything else shut down —

Square Pattern to 1" Screen hole at Dryer if was kept

E

Instrument Lovers how about a case where you throw fields on to light line & you find that open = Why not weaken power generator field

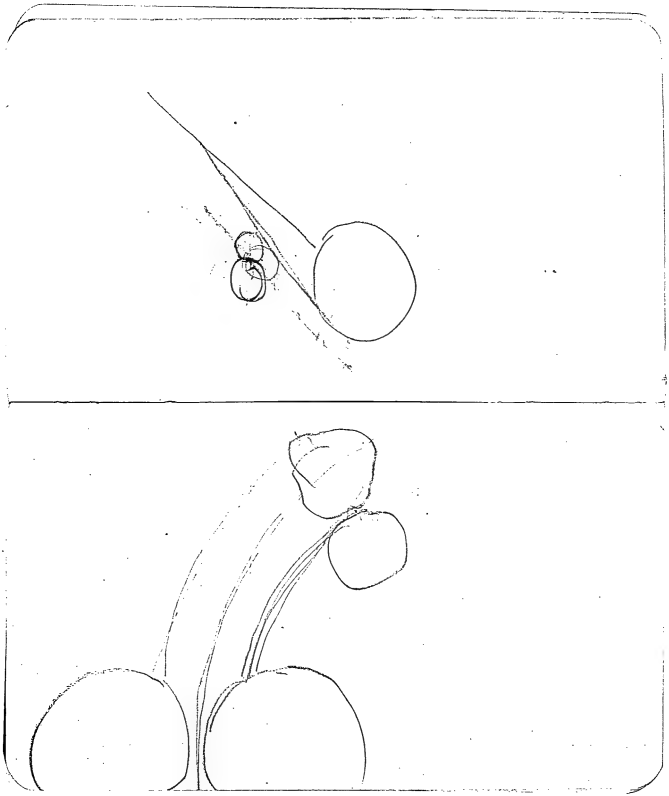
Send Dryer pyrometer back for calibrating

Send to Lab for Beg Hg Thermometer

Quage quand oor fane
on armatu –

Turned for ant for
extens on forms and Mat
words

How are fan slud
on Mations Locked



Dec 27 1904 – Bat

a + b ferric hydroxides, Ferric Chloride should give out a hydroxide but not b – The a oxide = Ferric Cl are precip by adding Na Sulphate or Sul acid –

a is obtained by precip Ferric salts by alkalies b is obtained by oxidn of Ferrous hydrate, Ferroso ferric or Ferrous Carb –

Spec g a 5.11 b 3.95 –

Can detect Hemp in KOH by Comp Lower + dissolving in ammonia –

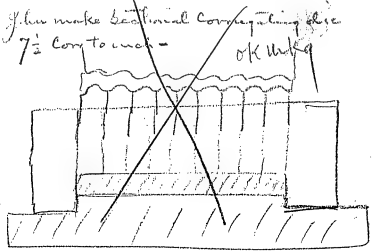
Put some Crops in 21% alco CP Medical ships Also. Cold – another bottle 21% warm – another bottle put iron, another bottle put Crops plated 1000 more – another bottle, put Reg Crops + Rubber Warm – date Item –

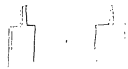
Put a large bottle with 100 Crops in 33% warm for future Exper

DEC 27 1908 ordered made

Plan make sectional corrugating disc
7½ cor to inch —

OK Mike





Check flanges & Webs & cast them
Columbian grooving press pieces with portions
flanges cast —

Look up discarded Aluminum
grids see if much come out

Take cups from 33% heat, wash chlorides
1½ D. then heat calcined test volume expansion
is — Lime —

Moor, Wolke [illegible] stains + gives brown fuchs + mitos stain.

group green M.Oct, no graf 3.2 after press, soak green alcohol 24 hours dry 3 hours

group as above but put in 33% 48 hours then water 50 hours, change water 2 or 3 times, then dry 6 hours hot plate, then soak alcohol 24 hours dry 3 hours

Soak CP graphite in water quite a while acc of puffs when put in flame –

Acc of I have ~~[illegible]~~ gas into Aluminum + 2 ~~[illegible]~~ Chromosphate + dilte H_2O_2

Dissolves some raw graphite in NH_4Cl + NH_4 acc of any residue –

(try 33% Carbs soaked long time) in Alcohol acc of time some carbs off – dilte Benzol – ~~[illegible]~~ appear off some –

Try Iodate K with neutral Calcium

Group 3 Carbs + 2 Carbs 1 grid in 33% –

Dec 28 1904

Try group with 2% KOH
" 1½% NaOH
This will determine relative
Conductivity of Double
above amounts —

group with ½% Ferric hydrox
200 mulg each cell —

ditto Ferric hydrox
200 milligrms —

Charged this soaked 21%
1 gram to 100cc KCy
Soak 10 minutes —

Old 26 — in 21% with
100 mulg KCy —

group - 500 mlg Aluminum
& 2 grams Fluoride K
Each Cell -

See if there was 2 grams
Fluoride in previous last
per cell or the whole -

Run old Aluminum in
fresh KOH, see if recovered

See about drowning up some
iron cells, some sugar no bottle
bottle & plating them - also
work up a copper grade -

Look at Sulphide Ag H_2O_2 don't
probably H_2S to crystal alkaline
in grades, ? [illegible] with KOH

group 250 mlg Al -
2 gram Silicate Soda

~~See if Silicate Soda pp alumina — No~~

~~Group changed Gibbs with 100 K Cy mulg Each cell,~~

~~Group 1 gram K Cy Each cell — then put K off after 1st discharge —~~

~~detto with 1 gram $CaCO_3$ + 1 gram K Cy — [illegible] K off after 1st discharge —~~

~~Remove after soaking + drying group gone bad by alumina spot in new pockets & [illegible] 21 p see if it's contacts —~~

group with Benzylene Lacquer
on inside 2 coats —
to keep off discoloring glass
Try Reg Group —
test Lacq for Aluminum
Edison test Lac by burning
see what it is —

ask gwa if some cells have
sulphates can't it Eveslaw
of lack Ba in KOH.

gwa make some CP Rubber
& Asphalt Varnish for
inside insurance cells —

~~Group with Benzylene~~
Gibbs also asked me to try
Iodine sol for insurance cells
NG

~~Put in glass tube about 25 new sheet cut to 2 mm long in 21% ditto. and glass tube cold open drawn glass to fine point set aside with date~~

ditto Cups — 21%

ditto Reg M 5 in group set away for 3 months
21% do 12 1/2 NaOH for metal

Consult Hodges & Rogers re: if its possible to make a 4 to 4 1/2 1000 M Cup — plate 1 1/2 1000 making bubbly ~~[illegible]~~ 1 1/2 1000

Phtalic acid — group

Try frothing with 12½% Na oh from metal –

Mercury Diphenyl –

HgO HgCy2 Oxycyanide –

K Picric –

Sodium Metaantimoniate – only known crystal Na salt, its slightly sol – Try for Al –

Try Na or K Hypophosphite

Hurry up Bechman on Mouted for little nickel jaws – Hurry John Jaws Castings Bed Mouted also make Mder Sylind with 1½ draft –

Be sure soak & remove a
bad aluminum & put new
Cup =
also see about KCy in a
bad aluminum

Change 9 hrs & start
new 16 oz. -20000.

Follow up the Hon pyropion
72 —
also the single over
with Hg only in Solution
as Cyanide —

Try Surface over Hon Hg Fran
with Tone Chl see if
does stops and any other
precipitate by Na Sulphide

See Fred OH & H mistakes
in Numbering stops 5000
Cups with Aluminum

Take 5 Chgd Gals
heat half alcohol —

Try $ZnCl_2$ in alcohol it dissolves

$2NH_4Cl\ ZnCl_2$ - double Chl
used for absorbing oxides
Zn Fe or Cu - for soldering
use Conc Sol —

There is a neutral Chl Zn

Protochl Tin Sol Chestnut

$SnCl_2$ forms Double Salts
Keep from air = forms Double
Salt with NH_4Cl. Ba Sr Ca

Neutral + acid Tartrate Potash
dissolves Alumina

Try Tartaric a + etc Salts
again

Tartrate of K · readily dissolves a number of oxides forming double salts —

Rochelle salt, K Na Tartrate,

Record Aluminate
Letter on Al_2O_3 2 to
in Rubber MIX etc —

K Nitrite — forms double salts
Double salts
Dissolves Glass water

Alcoholic Potash Hot

Ferric Nitrate, dissolves
Ferric OH, great many
Preparations, all sol
Water —

ditto Mercuric Nitrate

Monkey with phosphate salts
with Fe. + also Aluminum —
perhaps Al will not be used
in presence of phos K
try group

Qwa — see if Fe dissolves
in presence of KI in KOH,
ditto Na_2OH, or of Cambines
with MnO_2)

See how it behaves getting of any

Acid K Sulphate,

Acid Oxalate —

Group dipped 1 min in
Conc Sol NH_4 in Nitly NH_4Cl
dry to drive NH_3 off then
dip 10 sec + dry between
Each dip — several
times —

Make another Sol NH_4 & NH_4ClO_3
& do same thing this is
better as whole will go off
by heat, make groups
also Evap some of Solution
in watch glass see how it
dries -

Are those Eyfet pockets
Nickel plated if not
send to Pharo-Works

Try Benzol, Alcohol,
CS on Little bottles
graphite also CP graph
see if anything dissolves
out on Evaporation

Soak 50 grubs in bottle
till no KOH by litmus
then make groups
as Experts show

Get fululong no asphalt
also Rosin in Kerosene
also proper Solvent B.G.

See The 10% KOH No 2
Gug Cell Endurance

Try 500 mg Al in NaOH
12½% & one 6½%
ditto 500 mg Al in
KOH, 10%

Treat a Reg group after
1 run + (a soak to get KOH out)
with Chlorosuma + DMF to lock the
particles together electrically
also after ½ day Runs,
forget KOH out —
also gets [illegible]
ditto do this w changed plate

See if its possible to dissolve Ni in NH_4 without a NH_4 salt, also if not possible the minimum quantity of the NH_4 salt to get strong solution - Its OK subject to CP Ni NH_4 - for the NH_4 $NHCl$ also Aq in NH_4 =

Also Run 3 times a day approx - Soak - get out all the KOH, then treat with the NH_4 Ni solution, then dry & put in KOH, take out & dry, hard & then soak KOH, get burnt & then Run Reg -

Run one of the Mahaneys say 5 after 4 taking cake with 1% KOH, then ~~Run~~ Run 3 or 4 times changing KOH, then soak water & get KOH & work with the Nickel ammonia solution

Mn_2O_3 dec in NH_4Cl without aid of NH_4 salt, OK

Pour some several times [illegible] make [illegible] Run those [illegible] at times Change [illegible] acc [illegible]

Manipulate the 26° —

Take 4 Cups from 33°/o down stairs [illegible] wash — dry — then grind up Rag see how they run —

Make a die & make some narrow cups ~~[illegible]~~ 3/0 to grid —

Try in place Ni Cobalt Nitrite + use with usual K Nitrite in the 21°/o

Try 200 mlq al with 2 grammes Cobalt Hydrate acedy to with K well not take al from CO OH, but goes down when it is precipitating —

Try 200 Mlq al fresh 2 grammes Acetate Soda and K OH —

Make some Cobalt by H + use to 8°/o Hq

Try KOH 21°/o containing 2 grms NH_4 — + use iron pocket experiment [illegible] acc of more iron goes over with the NH_4

Groups Ni Reg recovering change
jelly - take out and soak KOH 3 or
days to evaporate same pressure in of
pots. There may be big thing here
also soak in water [illegible]

ditto Sec of Use of Cloth [illegible]

ditto, increase corrugly pressure to
150 atmos instead of 1 -

all the things dipped they clean directly
& work quite dipped quite -

Cause made in [illegible] to recover
[illegible] in getting Models
to the Office & then [illegible] minimum
[illegible] to desalize it -

Try 150 sucrose [illegible]
150 Con on group of Thy Thin
Cups & group 005 Cups -
also [illegible] group - see if
the [illegible] pressure groups
now not do the Reg or Reversing
[illegible]

Cup with gelatin [illegible] till dies
Come together [illegible] in up
Ni Ulty - ~~Heavy~~ (Neamino)

Reg change jelly & [illegible], then
change again [illegible] KOH
& dipped Neamino 3 or 4 times &
drying between each when small no
Ulty

ditto same & then recurrogate
& dip 3 times again -

ditto new cups not dipped but has
multiple cups

Evaporate down some Neamino
see how cloro it can be made,

Change dec in 33% then
soak water, get KOH all out then
treat Neamino 2 or 3 times

Charge dissolve 33 Soak fuck KOH.
Remove acid — 4 Run Reg —

Also as above but after Cr[illegible]
[illegible] 4 drying & recrystallize
twice in 300 [illegible]
[illegible] Chlorine —

Group [illegible] of [illegible]
Mannite 3 times

Also some of the [illegible]
10 mesh [illegible] 150 [illegible]
[illegible] Mannite [illegible]

Also some of decomposed
Silicabide. 1st [illegible] for Silica

See how powers the big block is —

Write Acheson see if can
supply Charcoal
also be sent samples [illegible]
for all kinds [illegible]

Group charge [illegible] 33
add fine [illegible]
[illegible]

Group roller [illegible]
[illegible] Mannite —

13 Iron mesh with 180 mesh
Silicide on top, charge [illegible]
[illegible] Run well 2 Reg
[illegible]

[illegible] way that [illegible]
[illegible], [illegible] grain, get
[illegible] dry, take into powder
with pestle, weight & put in new
Cups 100 smooth 150 coming

Try platinum onto a strip
from [illegible] some.
Meanwhile, up to cut [illegible] that
is real process. Many [illegible] power.
platinum

Group [illegible] [illegible] dissolves liquor
then the [illegible] [illegible] cell reversed
changed then chg & dis Reg
then Rev chg & chg dis Reg
& so on 200 [illegible] can make it
[illegible] & Reg —

Group [illegible] put in [illegible]
Cups no [illegible] Reg process
& Cups 150 & 150 C

group 150 & 150 C with
250 [illegible] ammo —

Group [illegible] then get [illegible] KOH
dry & [illegible] time [illegible] &
put in basin for [illegible] hours
[illegible] time [illegible]
some [illegible] & then dry — & Run Reg

group Cubes, get [illegible] KOH, dry
then powder & put in new pockets
Reg process

Cups 150 & 150 C

Make mush of graphite powder also dipper & plant group of Cups & try then wet mix also [illegible] Ni want oxidize to insulate [illegible] graphite Cuticle prevents [illegible]

Try a green also, [illegible] with 3 gals quantity cups [illegible] in 35% [illegible] Ni dep 30 hours [illegible]

Try Group with 3 [illegible] Nitrate & [illegible]

Try with 300 [illegible] dep [illegible]

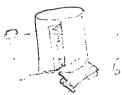
dep 0.05 [illegible]

Richer portion of Crystals Hg in Globs. Study Cups in relation to Coverings —

Group 2 mix Aluminum powder in mix of each cup —

Test depositing from [illegible] mixture alone on strips. See which way it goes dep small [illegible]

Rubber [illegible] on Ni plated [illegible]



Coordinate [illegible] —

Exp. int. gwt to substituting the
surface of Nickel by S & heat,
(10) pockets, then put KOH;
see if attacks — also of Condensor

Chg. + Sc. then chg. Soak
left all week by [illegible]
KOH none, then discharge
& charge + finally discd.
Reversed with milk water,
take out look more see
if all broken up —

[illegible] of [illegible] Soc. [illegible]
SSC. products electrolysis
[illegible] KOH, [illegible]
[illegible]
Solution [illegible] a
[illegible] Cerium
pp Cerium Nitrate

$C_{12}Ca_2O_{13}$ also the filtrate after
neutralizing of the KOH yields pp
with Ba Nitrate, on Centrifuging turn into
Sodium Salt then into Lead Salt
& decompose the latter with H_2S
in acid liquid [illegible]
which what neutralizes [illegible]
yielded Crystals Ammonium Pyromolybdate
then Crystal hydrometalate.
Keep the mother liquor [illegible]
[illegible] Cerium precipitated by [illegible]
at 110° of Iron —

Set up a pair of Cups
& use 300 milligr. Copper
filled with graphite [illegible] from
Centrifuging & [illegible]
[illegible] and wash [illegible]
(not) — Dried 2 weeks
Open & Examine Copper
also weight [illegible]

Fully chg + dev a reg thin
Chg + [illegible] KCN,
off spot in water see if it
blackens and dev a little [illegible]
[illegible] not [illegible]
then [illegible] to see [illegible]
then [illegible] chg
see [illegible]

2 groups chg [illegible]
Chg — then free of KCN,
Run + look out for
Chillipar — other
groups — heavy dev
[illegible] of water, look out
for Chillipar [illegible]
[illegible] out —

Make some thinner
weight green that is possible
make 10/1000 frame from
sheet Ni — soak in 33% 24 hours
in CP nickel fresh — ~~[illegible]~~
~~from Metal~~, Pb 21%
~~today~~ see how thin can make —

With 3 plates [illegible] chg
1.75 grammes in profit,

Makes a group 3. 2.8 2.4
2.2 | 2 1.75, 1

Also group — with 2.4
alternate dip in Nimino
5 minutes + dry —
also group changed + dev
then chg + got KCN pass
+ run —

[illegible]
[illegible] through 20 +
gradile [illegible] after [illegible]

also group with [illegible]
2or Bringsted & thin as possible
from mill [illegible]

[illegible]

[illegible]

[illegible]

[illegible] several Snake Venom —
[illegible] aggregation [illegible]
[illegible]

Room — for pocket only

A Bartoli + G Papasogli
(Gazzetta 13-22-27)
(Gazzetta. 13 = p 37-55)
(Chem Centr 1881-327 328)
Chem Soc - 1882 p 58-406- 850)
(Acad dei Lincei 8 89 1779-80)
(Cimento 8-278 10 204)
(Chem Soc 41 1883 p 592)
Chem Soc 1886 469
Chem Soc 1884 1239-177-
(Bredie, Ann Chem + P C XIV 6)

Find Green Ri group + run in
500 mch Aldrich —

detto another copy in
500 mch Fodel R —

Try Fluke Ne also CO
in 10%, KOH, also
NaOH,

Groups of 100 milamperes of
following Compounds
Ferrocyanide K
Kly-CoCy HgCy HgCy
" CaCy CaCy
" LiCy LiCy
" CuCy CuCy
" ZnCy ZnCy
" AgCy AgCy ~~CuCy~~ tolite
" CdCy CdCy
" CdCy CdCy
" CdCy

All above double Cy salt must
dissolve in KOH 21% —

Group 2 grms Melitate K

Try plating Ni on
Hg in flat porcelain dish
but get bubbles —
probably it will work good

Possibly Ni by H, coated
Coat the green particles
Check enough by warming
WA by ~~H~~ filing point

When get crump and thin
pkts JK try Lyra
series of Ni OH2 by
the dry process using
dry from battery

Look at Curtis see Calliger
Vittage & 500 rds in open the
OH runs 2nd run —

Ask Dyer how Gomes patent
ever got to Supreme Court

Get from Melite some
Mellitic acid —
Then put up compound Hg
and add 1 gramme of
Enobtex — see if goes
good,

of the same series as Mellitic
also phthalic acid,
Terephthalic acid,
Benzoic —
Benzoic 1
phth. no 2
~~Terephthalic 3~~
Terephthalic 4
Hemimellitic 3
Mellophanic 4
Unknown 5
Mellitic 6th —

Plate on Magnesium
flakes —
plate on Zn then dissolve
(1-2) plate Zn then Ni
then local action —
KOH sol for Zn also
Sulphate, ZnCl KCl etc —

Mag (then plt on 33
chg's time — also only
chg hot.

Ring up big sheet, Copper
or brass polished plate Zinc
then Ni + strip Collect enough
to make 6 group 2.56 Ni
bal ni to 3.2 - 200 Corrugated

also by Copper in KOH & Zn the
wire
Try Magnesium in Reg Sub Zn
if don't go try in Zn KOH —
then nickel - Try Ni above
by rate see if strip —

Use polished Ni, put in
Nitrate K for 5 sec
anode, then plate 4 minutes
take out wash put in
Nitrate again anode
5 sec + so on make
dozen dipsa see if
they separate,
possibly Zinc first,

Try paraffin etc on
2nd square, then plate
see if works OK —

See Hooker about using
Block size of thoughts
in Lund work 5 at 2w
Medium Block —
Everything Else standard

Makes slides ready of
Blower so any Lund
in future dropping of
any Kind Can be made
in —

3 gms grams charge
against KCy 100 mlg
KOH twice then
put in fresh KOH
run

drits Chg ~~[illegible]~~
same KCy 100 mlg
same procedure

Drop with Farmacy K —

Drop 3 gm grams charge
5 hours rest 10 chg 5 —
rest 10, chg 5 rest 10
chg 5 total chg 20 hours
then, dessly —

also chg 33% hot 5 hours
rest 15 hours chg 5
rest 10 + 20 on till
15 hours on Jan 125 —

Soak old 26 free KOH
dry + recrystl 300 at

E 18 — 10 gms KCy
charge against Lund
then poured out 3 al put
in KOH soak charge
again till no KCy
varied Hour 7 ½
charges —

group 2 now no Hg change 24h against
strip in 500 cc KOH 20%
Containing 500 milgms Cyanide Mercury
Open one iron seed & unbequeathed —
Also change Group Ni 500 cc KOH
Containing 250 milgms Ferrocyanide
K —
Then put Ni & Irons together after
soaking out the HgCy &
Run Reg —

Soak dog bits dredge pkls
till free KOH, dry — 64
Then take mix out of
weight — then powder & put
in dropbits, Bag & press &
Cor
200 atmos —

group green just as it
is (Coarse) in big bottle
dont crush —

Try with fingers prelim Expt
Covering green with the flake
nickel damp —

Paint strips on Copper strip
with Benzinum V varnish then
plate Zn & Ni & Eat off one
of varnish permanent,

Squirt green NaOH in Coke
form —

Iron Cr Co Mn are the
ones that form with Cy
a Complex Molecule
colouring as radical
use these in Cathy

Group Reg Ni 2 milgms
another 5 milgms
another 10 milg Ferrocy it
morphous Calylight —
ditto green N groups —

Big Magnet over a coal Gelt
feeding to Coal Rolls
Catch iron —

Feby 28 1905 Cakes to soak Na salts
mixed by H, a after also out
stuff of cake.

Carb Ca Sr Ba Mn Mg Sb.
Zn

Acetate Lime sublimes at 190 C
Mix with Non Volatile Salts —
also chl Amm Phth. [illegible]
Chloride Hi - Carb Hi,
Sulphate ammon Arsenious oxy
Vol 218 C
Arsenates of Iron Mg Na -
Bunsten
Acetates Cooled in Redby H,
Benzoate Salts at 249 - Lanum
Benzoate Magnum see not stuff
Borates, Ca Mg
Carb Ba strong heat is losing - Sr dito
powder - mixed with Collodion
Gunnout, Arsenous Sulphur
Na mush stuff with MgO def pyrophos
also with Volatile

3 of carbon ox Ni 1 of amc
ok 2½ to 1½ 100 mesh
NH4Cl added 62 got very fine
& Grad upward —

Heat of Combination

CoO.H2O 63.4
Co2O3 3H2O 149.3 —0.7
2 Co2O6H6.O.H2O. from ox of Co2O3

NiO.H2O 60.84
Ni2O3 3H2O 120.38
2 NiO2H2 O.H2O — 1.3

~~CoO.H2O 63.4 from oxide hydrate to oxide~~
~~metal O xy 149.3 — 1.3 ~~

Co Hydrate, 63.4
Co2O3 " 149.3
2 Co2O6H6.O.H2O — 0.7 from oxide to

Ni Hydrate 60.84
Ni2O3 " 120.38
2 NiO2H2 O.H2O — 1.3 oxide from
from ox to sesquioxide

March 5th 1905
Mix Reg non with
Molasses dry then
Crush to through 20
on 100 - Coat Nickel
flake - graf - Bismuth
etc also no Coat good for
filing

Mch 5 1905

Mix smelting with $Ni(OH)_2$ & flake Ni after flake in a day that is oxidized & one dried & well broken up & so made in the KOH, so a well coarse cake place in dishes with and smelting & water & HgO possibly BiO_x

Flakes –

Ni 10% Co 90% alloy flake by Roll –
" 20 " 80
30 70 +30 mesh

Ni 90 – Co 10

Ni flake plated Au Ag Pt, Sulphur also Co_2O_3 anly

Try Ni_2O_3 anly with Cobalt flake also Ni

Mishmash –

Prepared Tungsten Bronze for Carbody – no place

Ni flake –

Mch 5 1905

It is advantageous to size the Ni Pt/Z as large as possible say through 15 or 30 but probably for Carbon removal may have to go to or 100

The finer powders then ground fine & returned to the finish Ni finish & reduced to be crushed over again – The Carbon the particles the less flake is required to cover it + more porous the cake will be –

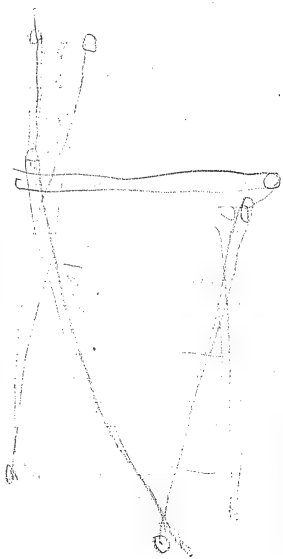
Heat Uranate Na & K see of Carbonate effervescence

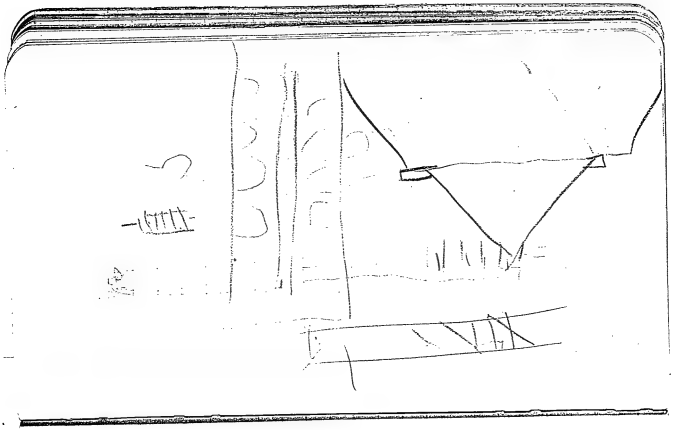
Ni flake Coated Ni_2O_3 anly mixed – also $NiCO$ for Pt.
Coated Co_2 & then made anly dark

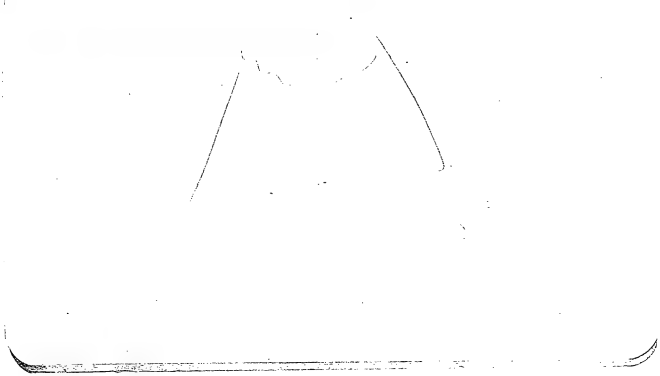
Look at graphite from old No 26 Cup by Brandmile Light

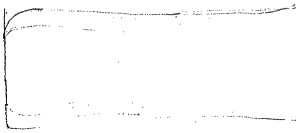
Mch 5 1905

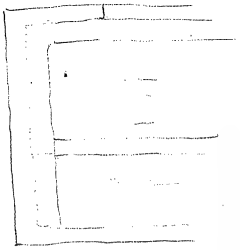
Charge + dis a pocket
with metallic flake
put in Mercury process
then take out dry +
recorrugate —
also another soaked
10 mm H_2O — dry +
recorrug — see if permanent
swell lessened + if
it will keep so —









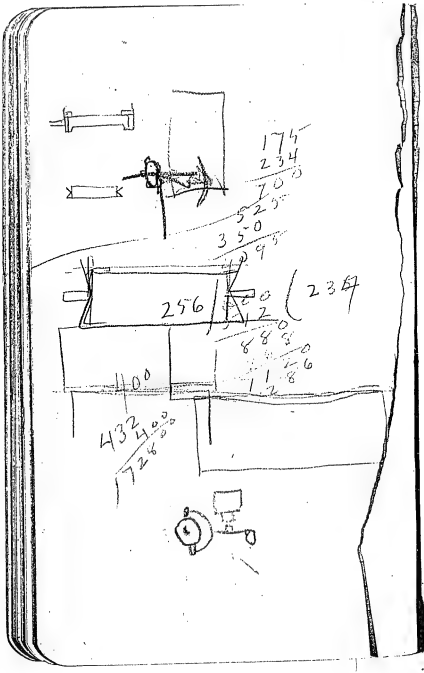


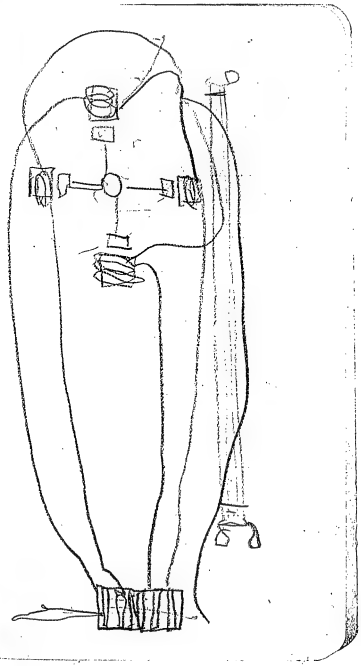
1" ft sqr. ¼/1000 thick 1/2 bath size
20000 drops to get 1 sqr ft 1" thick

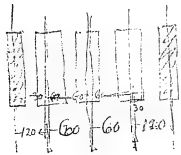
100 plates. 100 drops daily
is equivalent to 10000 drops
or 1" sqr ft 5" thick
or 3½ lbs

17
7 33"

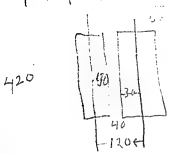
280
444) 280000 (

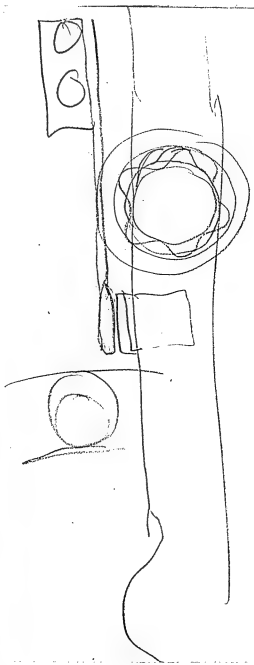

256
1100
432




120
60
60
120
30


140
63
140


420
40
40
120



256-

1.075

1.75

33

1.75

60-

40

4

5 1/4 lbs-

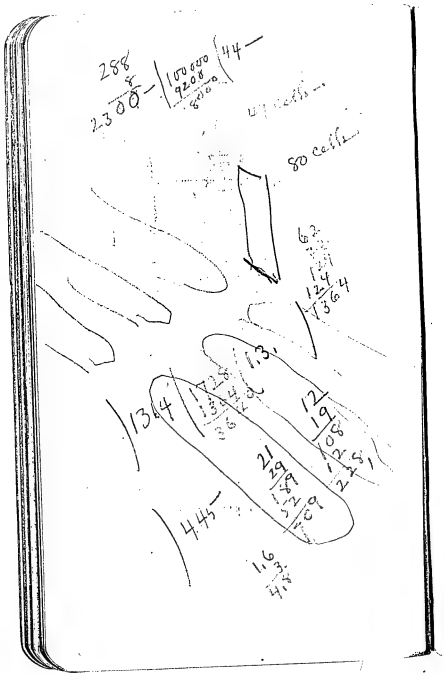
28

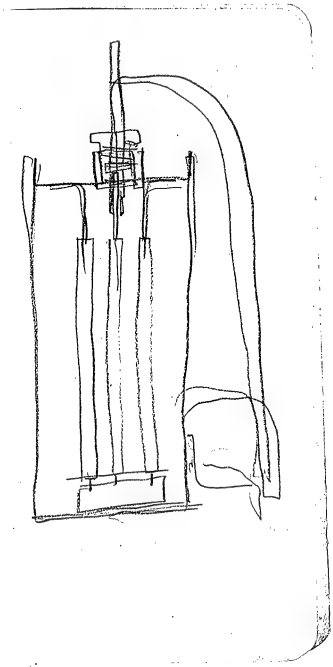
1.75

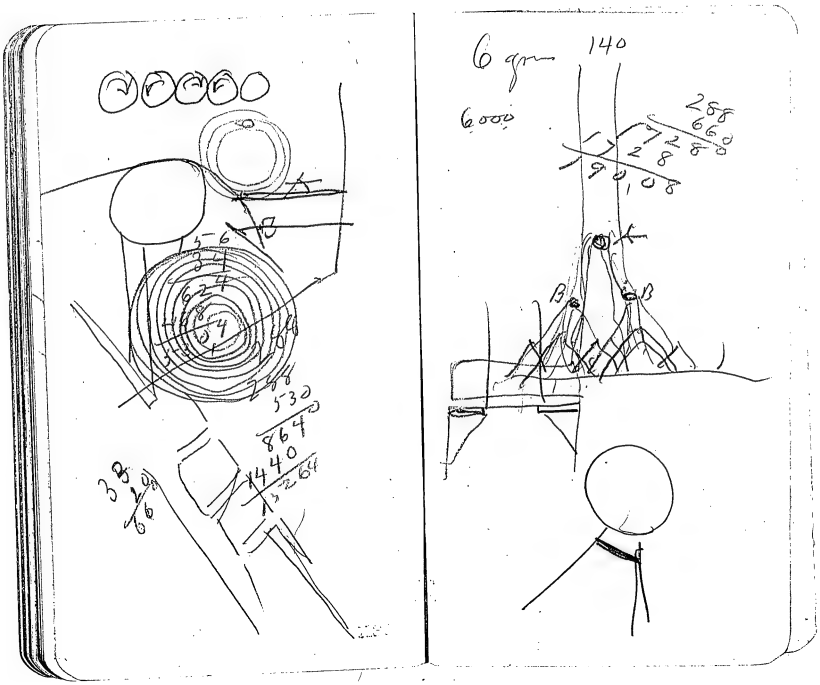
1584

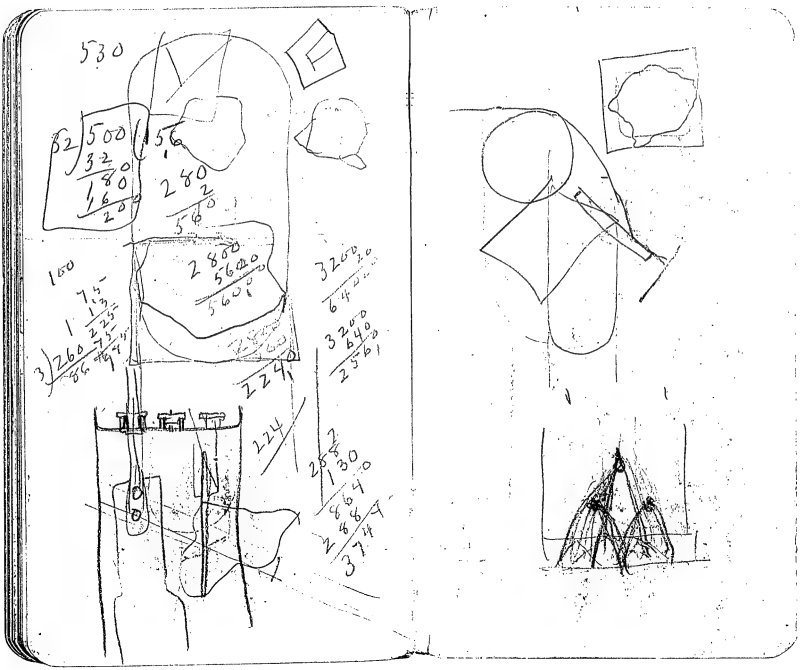
524

.53 26-


288
2300
100000
9208
8000
44
80 cells
1364
445




6 gpm
140
6,000
A
B
B
A



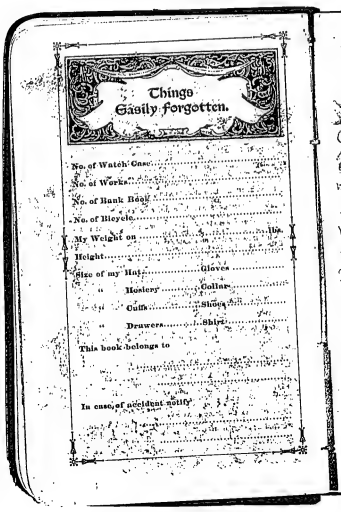
Notebook, PN-05-03-05

This pocket notebook consists of a calendar for 1905. It was used by Edison during March 1905-April 1906, and again during early 1908, primarily for notes regarding experimental work and other matters to be undertaken at the laboratory. Many of the proposed experiments pertain to the chemical composition and performance of Edison's alkaline storage battery. These include investigations of swelling in the positive electrode pockets, tests of various tubes for the same purpose, related chemical research, and the notation of mileage and routes for an electric vehicle. There are numerous experiments on metallic flake for battery electrodes, including one on cobalt flake marked "Curious!" A few notes and drawings relate to experiments with phonographs. The book also contains notes about the location and availability of cobalt ores in North Carolina and elsewhere. The North Carolina entries are copied from a book identified as "Wurtz." Included as well are notes about arsenical compounds and reactions; notes about the properties of bismuth; an entry by Edison reminding himself to notify Frank L. Dyer about filing a patent application on the use of cobalt in storage batteries; and some rough calculations and measurements, including cost analysis figures for the Edison Portland Cement Co. works. Among the employees mentioned in relation to individual experiments are Ralph Arbogast, Jonas W. Aylsworth, Otto Groethe, Frederick P. Ott, John F. Ott, and Ludwig F. Ott. Some of the entries may be difficult to read because of bleeding purple ink or smudged pencil. The pages are unnumbered. Approximately 200 pages have been used.

Leib
Moss
250 Morrell
30 Chuckwagons
750 Santa-Nippers

250
30
750
65
7500
37500
45000
4575
12 | 45
45

PN-05-03-05



Things Easily forgotten.

No. of Watch Case.....

No. of Works.....

No. of Bank Book.....

No. of Bicycle.....

My Weight on ..... lbs.

Height.....

Size of my Hat.....Gloves.....

" Hosiery.....Collar.....

" Cuffs.....Shoes.....

" Drawers.....Shirt.....

This book belongs to

In case of accident notify

Weat SUN. JAN. 1, 1905 Thur.

Feby 28 1905

Takes to work Nicoll's Rel by H.
[illegible] out the effect of
Carbolic Sp. [illegible]
Acetate Zinc [illegible] at 1 95
mix with non-volatile [illegible]
Also Amm [illegible] Chlor
Nitly Sulph [illegible] Ammonia or [illegible]
Volatile [illegible] Ammonia
Volatile 2 [illegible]
Conder in glass flask [illegible]
[illegible] Nitrate of [illegible]
Nicoll's [illegible]
Amm [illegible] Nitrate [illegible]
[illegible]
Amm [illegible]
Nicoll [illegible]
used where R by H.

Wea. MON. JAN. 2, 1905 Ther.

Wea. TUES. JAN. 3, 1905 Ther.

Mch 5 1905 = to make alg more more workable at factory mix with molasses enough to effect a firm dry - powder of sawdust to workable state - put in pockets press & soak out glycerine

Make alloys Ni & Co to make flake by rolls & oil process following from 90 Ni to 10 Co & varying 10% down to 90 Co to 10 Ni & make into cells -

Clean the Ni flake by Rolls & oil process by heat Hydrogen & also Co

Try Ni flake plated with Au Ag Pt

Try Anthy Ni_2O_3 with flake Co at first & ok try with flake Ni

See if Tungsten bronzes will stand alk in battery

Wea. WED. JAN. 4, 1905 Ther.

Wea. THUR. JAN. 5, 1905 Ther.

Mch 5 1905

Also advantageous to use the $Ni(OH)_2$ particles thru 15 or 30 but as this is not very correct can make it thru 15 on 100 mesh making of much coarser one possible. This requires heavy Mechanical + flake to coat surface thinly if it were fine that passing 100 mesh not ground fine enough not smashing $Ni(OH)_2$ or dried with it + Re performance

Next Urania Ra + K use of Conductor also in but Hydrogen

Ni flake coated with Ni_2O_3 only fused - also Ni Co alloy 1/2 + 1/2 Coated Co_2O_3 + then [illegible] making

Look at very thin flakes of graphite from old 16 candle bulb transmitted light

Wea. FRI. JAN. 6, 1905 Ther.

Wea. SAT. JAN. 7, 1905 Ther.

March 5 1905

Get some Ni Cups which [illegible]
been run long [illegible]
[illegible]
will clean it [illegible]
where it can be [illegible]
[illegible]

Get a couple [illegible] good [illegible]
pickets [illegible]
[illegible]
Drank 10 [illegible] H_2O
[illegible]
[illegible]

[illegible]
[illegible] Nicelaup
[illegible] Kold

Wea. SUN. JAN. 8, 1905 Ther.

Wea. MON. JAN. 9, 1905 Ther.

Mch 5 1905

H- Li Be B C N O F Na Mg
K Ca Sc Ti V Cr Mn Fe Co
Ni Cu Zn Ga Ge As Se Br
Rb Sr Y Zr Nb Mo Ru Rh Pd
Ag Cd In Sn Sb Te I
Cs Ba La Ce Pr Nd Yb Ta W
Os Ir Pt Au Hg Tl Pb Bi
Th U —

Insol KOH, Ni Co Mg Fe
Cd Ce Ur Pt Ag Bi
Cu

Pt — following Cup
Silver Pt 70 Co 30 Ni
80 Co 20 Ni —
Cupelled Ag —
Cu plated Pt, Ag — Ni
Sulphurized Ag — Ni
Co — Cu 72 Pb Bi Hg
Cd Wo Mo Cr V

Wea. TUES. JAN. 10, 1905 Ther.

March 5 1907

Wea. WED. JAN. 11, 1905 Ther.

Selenide Ag Cu Pb
deposited w/ acc of Selenium
by donating or giving
freely on by reducing -
Try strip ceg Sulphings
also Selenides -
graphitoidal Selenium
Selenides
graphitoidal Selenium
not affected by
Nitric & Chloride
K bodeing or alkalies
See Pentlide Telenide
Chromite & Sandro
also Molybdenite

Wea. THUR. JAN. 12, 1905 Ther.

Wea. FRI. JAN. 13, 1905 Ther.

Silver Nitrate: Hi Co:
Etc –

Niobium Nitrate Combined
Elec – dull black powder
not attacked by Nitric
Scarcely by Aqua Regia –

To make NT, Elec –
Electrode was the
metal in Positive
& Platinum Neg in
Ammonium Chloride

Test

Wea. SAT. JAN. 14, 1905 Ther.

Wea. SUN. JAN. 15, 1905 Ther.

Wed 9 1904

Molybden Phosphate -
Conducts Elec

Tungsten Molybden
not decomp by
acids or [illegible]

Write Bergen
about the Varnish
for Copper Tin
also the stuff
from Standard Oil -
for Crangs

Wea. Mon. Jan. 16, 1905 Ther.

Plate Ni on Iron
both sides, then roll
out to plate - & cut
now out - weld by heat
also plate Ni + Co
60 Co 40 Ni on
iron - then weld
in Hydrogen - roll
out to plate &
Cut out [illegible]

Wea. Thus. Jan. 17, 1905 Ther.

- Iron product with
annealing powder - plated
with Ag - 72 sides -

If the iron is with
Chlorid with Metallic
Nickel in H
form a hydrid -
then Reduce in
CO, If N, then
use Mg + Titanium
in atmos free
of N -
The plated Ni Co
Semi alloy
Heat in CO to weld

Wea. WED. JAN. 18, 1905 Ther.

Wea. THUR. JAN. 19, 1905 Ther.

Wed. 9 1905

or in Vacuo [illegible]
displacing air by
CO_2

Take Rifuse 33% chgd
dry with KOH
Then KOH for 200
Then boil in water
Then put 1 in 33%
The other in 21%
see Swell

Put swell again
1 in 20 1 in 200
see which greatest
well compare to fuse
also compare swell Gas
Cor & Rigor 33%

Wea. FRI. JAN. 20, 1905 Ther.

Wea. SAT. JAN. 21, 1905 Ther.

Mch 10 1905

Make a Co byH prepared
15% Hg Run on off side
get chg Voltage & also data
Sulphid. Etc

Curious! why doesn't
strong acetic a decomp
the Black Ni_2O_3 &
Co_2O_3 & take out of
the Cupro Nickel bags
Cobalt flake —

See if Sulphur solution
will remove
Copper from ground
Mineral Book 4
Nickel —

Wea. SUN. JAN. 22, 1905 Ther.

Wea. MON. JAN. 23, 1905 Ther.

Mch 11. 1905

Make packets already
Connected with one
[illegible] with [illegible]
put on Hydro [illegible]
Longitudinal [illegible] full on
end [illegible]
put on [illegible] for [illegible] Cor
Light [illegible]
Grooves along one
side [illegible]

Could fill tomorrow
by assembling on
[illegible] moving [illegible]
following Sey [illegible]
Arts [illegible]
[illegible] 5th [illegible]

Wea. TUES. JAN. 24, 1905 Ther.

Wea. WED. JAN. 25, 1905 Ther.

Week 11 1905

See Curve of growth on the growth chart

Had plants taken in

Marked No. 218

with 6 day 13/[illegible]

glass plate mixed in

to give power

when get plants to take

make growing 20 or 30,

then out in when in crop

150 much time to take pots

or inoculation, + process -

takes 20 or 30 - fold drop

pour melted manure

press + dissolve Pump out

Wea. THUR. JAN. 26, 1905 Ther.

Wea. FRI. JAN. 27, 1905 Ther.

or what will be better
perhaps put cups, bowl
+ hand pieces then fill
with paraffin by dipping
hot & cooling there
dis also with this have
proved possibly Southern
Under this paraffin wells
See [illegible] & [illegible]
[illegible] paraffin out
The paraffin will come out [illegible]
[illegible] supply effectually

Use 20 x 50 film
Crossed dup

Wea. SAT. JAN. 28, 1905 Ther.

Wea. SUN. JAN. 29, 1905 Ther.

Make some the [illegible] for burning till [illegible] oxide then reduce in H, to get rid of N.

dittto blackness in CO to get rid H or N –

Try Herman Blood flake –

Wea. MON. JAN. 30, 1905 Ther.

Wea. TUES. JAN. 31, 1905 Ther.

alloy of Ni & Aluminum

Al_6Ni large tin white

laminic SG 3.67

by method of pts of

with 3 pts sublimed

$NiCl_2$ & 20 pts

Chl K & Na & heating

reaction with platinum

$NiCl_2$ — ?

Ni_2Sb_2 Thin plates

this would work

in Na possibly

Wea. WED. FEB. 1, 1905 Ther.

Wea. THUR. FEB. 2, 1905 Ther.

No 50 in 50-plate
out the copper - see of
d fall pieces -

7½ Red by H, allowed
absorb CO_2 so not
pyroporic -

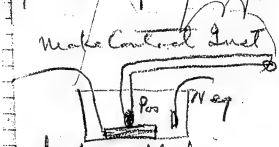
see changing
Economy of
Soft 4 [illegible]
prevented [illegible]

Wea. FRI. FEB. 3, 1905 Ther.

Wea. SAT. FEB. 4, 1905 Ther.

Treat a Reg E 18 -
when prime from KOH
by Burdmund water
after reversal to
get all the iron out
the market grid
in the Wechselline
stale — [illegible]
bad Contacts get
pocket + grid —

Make Control Inst



to test flake -

Wea. SUN. FEB. 5, 1905 Ther.

Wea. MON. FEB. 6, 1905 Ther.

Swellmay be largely
due to crushed &
Compacted surface
in contact with pkt.
& very closed holes
so fridlim of gas tight
at holes very great
by flake 60 Co 40
Ni grain w/ cups
with very open holes
can fill them open
then see if swell
diminishes or
also this & fine
COM Red by H.
Shack on outside
flake by Moldrum

Wea. TUES. FEB. 7, 1905 Ther.

Wea. WED. FEB. 8, 1905 Ther.

to gus gas passages

group Reg. 200 Hydro
chloric Acid mixed
Coring 200, 50 oils
Nacl fing, 150 meals

group ol Ricc, Cor 200
Soak, Rhommi all
200

group Cor 200
three nights 1/55
without Soaking

Wea. THUR. FEB. 9, 1905 Ther.

Wea. FRI. FEB. 10, 1905 Ther.

Put grid in gals oil
chamber & fill up
with 10 [illegible] water
2/1000 [illegible] for
2 charges that
remove clump —

[illegible]

Wea. SAT. FEB. 11, 1905 Ther.

Wea. SUN. FEB. 12, 1905 Ther.

Johnstone make model
rubber & grooves
top cell - wooden

See about Cobalt
plated cups -
See Webber about
the balling posts
drop [illegible] rubber
Chemical [illegible]
+ doing sealing balling
top posts, etc. well

Wea. MON. FEB. 13, 1905 Ther.

Wea. TUES. FEB. 14, 1905 Ther.

Warren make
60 Co 40 Ni by wea
Ni [illegible] + Co [illegible]
Scales 20 [illegible]

Nafcon [illegible]

~~Co [illegible]~~

Sulphate K 861
" Na 865

Chlo K [illegible]
" Na 818

Ni 1200 to 1400 C
powdered Iron Scale
thru 30 on 60.
mixed with Ni flake
or Ni Co flake -

Heated yellow white in hydrogen then now taken out,

Phosphate lime –
Gettsone opaline powder –
Mho 30 on 60. cover flake
press 150 above cover then
break out [illegible]
Re Cover 200 – then to welding
heat in H – then [illegible]
out lime [illegible]
also fuse press thus lime
See Lough report the
premature [illegible]

Mix Magnesia with
minimum Hydrosoco. press
+ dry, then powder +
press 30 on 60.

Wea. FRI. FEB. 17, 1905 Ther.

Wea. SAT. FEB. 18, 1905 Ther.

Wed Feb 16 1905

MgO, mount with Carb K under pressure & dry. Then powder & screen to one test. Coat flake Mg with minimum dissolve out Carb K Carb K & LiOH in H dissolve out Mg by HCl —

... of Carb Mag ... composite, carbonates or hydroxides to be made, first carb ... at,

Ralph to make

Iron by H, then press N on Hand to see if H absorbed. Reg Apparatus test —

Wea. SUN. FEB. 19, 1905 Ther.

Wea. MON. FEB. 20, 1905 Ther.

Speak to girls about
dangers of Hydrogen in
over Hydrogen & necessity
of a Bottle of oxygen
that is to be used
— Hot water plant —

Youth
Primaquasic phos
or Neutral Sodic phos
[illegible]
[illegible]
[illegible]
which he at [illegible] very
much better than
Phos Lime — Very
high Mt —
formed by pp Sol Mg by
Disodic phos

Wea. TUES. FEB. 21, 1905 Ther.

Wea. WED. FEB. 22, 1905 Ther.

Phos K melts in the at higher temp and Easily get more del -

Trisodic orthophosphate does not melt at strong red heat.

Put 1 gram, 0001 in Carat smooth press 25 almost, red heat,

also 1 with 1 gram 0003 — same press

Wet MgO with Boracic acid [illegible]

ignite to white $MgNO_3$ — $MgSO_4$ Mg acetate,

Wea. THUR. FEB. 23, 1905 Ther.

Wea. FRI. FEB. 24, 1905 Ther.

Qua quinine (crystls)
No flake hydroxide
Would cover it with
NH flake - 0001

Try $BaOH_2$ in a
solution of sulphate
of NH4 am - in
presence of excess
NH, Scale, in OH
dissolved

Get those amine
liquids & test boiling
$NaOH_2$ & flock hydrat

Wea. SAT. FEB. 25, 1905 Ther.

Wea. SUN. FEB. 26, 1905 Ther.

Try the NiOH in
hydrazine also
Ni OH & also
Hydrazine in NiOH
Determine the
plating of graphite
Co instead Ni
also Ni Co —
See claims &
look more closely
to Cobalt alloy
& Co alone
Fading

Wea. MON. FEB. 27, 1905 Ther.

Wea. TUES. FEB. 28, 1905 Ther.

Mercurous Sublimed
Chloride, scales
treated K +
Red Hydrogen -

Feb 26 1905

put in about 2 grms
Cobalt Glass (Grit)
make 8 grms
put them in 21 c
with 200 mm density
charging & shading.
see result, weight
accurately, want to
determine how long
use glass cap

Wea. WED. MARCH 1, 1905 Ther.

Wea. THUR. MARCH 2, 1905 Ther.

March 16 1905

[illegible] with Nickel for flake

Allanganese found ?

Ag Mo Wo Cr Ur U
Sb Ce Fe Cu
Bismuth

Volatilizing by sublimation a mix of 60 chloride Co 40 Nickel, [illegible] hydrated [illegible] 5 chlo [illegible] of 50 Can reduce by [illegible] for sponge

for making flake by [illegible] chloride [illegible] to [illegible] make [illegible]

Wea. FRI. MARCH 3, 1905 Ther.

Wea. SAT. MARCH 4, 1905 Ther.

Nitrides of Co & Ni in
light green plates & needles
by H & rail out,

[illegible] Pappenheimer's
is conductor
see in Collenbrook's
get chromite
from Oglebay's Norton
Was deposited as a
hydrated OX
along with Lellmann
for flake

Wea. SUN. MARCH 5, 1905 Ther.

Wea. MON. MARCH 6, 1905 Ther.

[illegible] from reading
Tellurium with Ni
would be safe for plain
when got 60 C. 40 Ni
[illegible] made groups
for 5% KOH, 8%
12% NaOH 33%
plain with Reg
green moles —
to determine Capacity
& swell — with
in Na & KOH.

Wea. TUES. MARCH 7, 1905 Ther.

March 8 1905

Wea. WED. MARCH 8, 1905 Ther.

Sponges cups deep in
chro MnCl2 dehydrate,
deep organs test not
full, Ollier book weak
KOH, till det name pos
then back string KOH
decomp [illegible] test,

Co & Uranium - Keller
serum of prevost
deep impress of Flesh
[illegible]
[illegible]
Uranate,

Co + Sb in NaOH,

Co + Mg -

Co & Cerium -

Co + Fe -

Wea. THUR. MARCH 9, 1905 Ther.

Wea. FRI. MARCH 10, 1905 Ther.

Cont'd

Spent Dyes -
Phos Tricalcic
after washing HCl &
taking out acid -
put again in HCl &
a long time clean
See of his mixtures
many dyes -
also speak of
Sol of Carb Mat HNO3
& KOH after a number
dips etc -
Make Shalimar Ni
for pith not very good

Wea. SAT. MARCH 11, 1905 Ther.

Wea. SUN. MARCH 12, 1905 Ther.

~~that~~ alloy CO_2 or
CO_2 above H_2O below
Not ~~it~~ makes CO_2 ~~and~~
without pressure other
than the own weight
whereas H_2O requires
some pressure to ensure
good contact. Thus
could be attained
by reservoir after
pickling but already
no closing more or
less air pump or
impeding circulation

Try CO_2 flooder only
if KCl clean it

Wea. MON. MARCH 13, 1905 Ther.

Wea. TUES. MARCH 14, 1905 Ther.

If so spark also

Rugos to Expert on
drawing tit on side
Can despair -

March 22 1905

Try of Ammonia
Ammonia Chlor. -

N. O. on [illegible]
+ of more than water
solution

Not so much

Wea. WED. MARCH 15, 1905 Ther.

Wea. THUR. MARCH 16, 1905 Ther.

[illegible] formaldehyde
Why in ice will
dissolve more
[illegible] [illegible] of [illegible]
formic [illegible] [illegible]
Notice [illegible] things in
the solution [illegible]
fresh will [illegible] out
water in [illegible]
Why dissolve a chem
daily on [illegible]
use ice around
jar when dissolving
[illegible] Notice [illegible]
through
1.25 % dissolves

Wen. FRI. MARCH 17, 1905 Ther.

Wed 23 1905

Wen. SAT. MARCH 18, 1905 Ther.

Daddy made some glass improvement yesterday, then fell by passing the [illegible] at 9.20 - much of glass in motion

Hard Caustic
Borax,
wet with Conc
Sulphuric Ac -
Dry & Red with
Ac

Wea. SUN. MARCH 19, 1905 Ther.

Wea. MON. MARCH 20, 1905 Ther.

Wax mash the C#.
with lime hard
burned particles.
Reduce in H, T
Slake Lime to
make flake

Try peroxide from
igniting Metrall.
with MHP

See if McOtten
MH, Can SE

Wea. THUR. MARCH 23, 1905 Ther.

Conc by quick lime
and solution to
absorb CO_2 H_2O
or liberate free
NH_3 which
can be absorbed
in water -

1 Hyd atom may
be replaced by
Mi & the resultant
compound stable
similar free NH_3

Wea. FRI. MARCH 24, 1905 Ther.

Dry or potent
on Co & the Co
in dry cell -

Wea. SAT. MARCH 25, 1905 Ther.

April 21 1905

[illegible]

Wea. SUN. MARCH 26, 1905 Ther.

Rosendale [illegible]

Warren make sure
70 Co 30 Ni flakes
for test as a sheet
00005 0001
0002 0003.
Louis [illegible] put them

Wea. MON. MARCH 27, 1905 Ther.

also 60 Co 40 —

also 70 Co 30 Fe

60 Co 40 Fe by Electly

Sept 24th 1905

Wea. TUES. MARCH 28, 1905 Ther.

Ferricy of K & Potassic Co
pp in thick dark red
flakes Granular

Cobalticy of K forms with
Sul Ni & K pale lapis
azure colored flakes

Ammonia-Cobalticy Ni
found by also pp Cobalticy
Ni in Ntt, if Evap
very slowly deposits
Crystalline scales &
Granular —

Sesquisulphide Cobalt
graphite Lamanie
Fellenberg (Pogg. Annalen
I. 73,
et
igniting protoxide Co
with Sulphur & an alkali

Potassium Cobaltic Oxalate
mixing $CoCl_2$ K oxalate & oxalic
in water to thick paste rolling
mix remain 21 Days - black
Lamanie —
Rehrman (Ber, 19 3101 —)

Tamine Cobalt Salts
the Sulphate Cyanogen
in small scales
Mann J SIC [3] VI 116 126

Cobaltoïtamine Salts
Iodide. $Co_2[NH_3]_8 I_2$
$[SO_4]_2$ Brown Crystals
Ba Salt yellow needles
Vortman & Blumberg (Ber
22 2648]

Wea. FRI. MARCH 31, 1905 Ther.

In reducing Cobalt by Zinc part up to time of Cobalt reducible Metal Copper — Chl Plat, Bi

Lecoq de Boisbaudran says CP Zinc does not reduce Co except in presence of easily red metal.

Chloropurpureo cobaltic dichromate, Scribe

Wea. SAT. APRIL 1, 1905 Ther.

Solution of Luteo Cobaltic Salt. — Na pyrophosphate added gives precip of Leaflets insol H_2O or NH_4 —

$3[(12NH_3)\ Co_2O_3 + 5P_2O_5 + 40 aq]$

Try plating Zinc by Double oxalates Double sulphate Zn + NH_4 or mixed oxalates Excess oxalic acid ppt formed the cleaned by adding NH_4 sulphate mix clean pot with NH_4 or slight excess heat gently few minutes

Classen

Wea. SUN. APRIL 2, 1905 Ther.

[illegible] K Cobaltate
tablets —
CoO dissolved with [illegible] pts
Mixture contains
present for some time or
tablets [illegible]
Cool & treat with H_2O
K Cobaltate insoluble
decomposed at 200 C
H_2O then dissolves out K_2O
& Co_2O_3 remain

Wea. MON. APRIL 3, 1905 Ther.

Barium Cobaltate.
15 grms superoxided BaO
mixed with 6 grms finely
powdered BaO & fused
to red heat red. 1 grm
Cobalt peroxide added
in small portions.
Continue heat, after cooling
wash out K_2O & finally
treat w — Block
dam Glass —
Ba Cobaltite with Ba Cl
Crystals from fused mixt
Sol in tables
(Wedekind) (Zeit f Chem
[Z] VII 61

Wea. TUES. APRIL 4, 1905 Ther.

Sublimed arsenic forms a mirror on glass, procedure disl. enumerous traces in Cobalt solution form arsenides, then Reduce by H, Expmt

$CoCl_2$ on adding ammonia to an alcoholic solution of $CoCl_2$ rose red leaflets leaves off the alcohol of Crystallization

Wea. ~~FRI.~~ APRIL 5, 1905 Ther.

Coe Mfg Co —
99 Johnson St
Sheet Metal

Crystal) phosphate of Cobalt
pour into solution $CoCl_2$ a
deal of phos Na in slight
excess. pp forms blue Cobal
divide in 2 parts one
dis in HCl avoiding excess
then add this to the other
1/2 & leaves (Sherlf)
after a time agglomerated
Lamellas, beautiful Violet
The chemist 1856

Wea. THUR. APRIL 6, 1905 Ther.

5 20 pm

105 75 miles

Elizabeth 6 pm

Rahway 6 28

Manto 6 43

New Brunswick 7 05

left 740

Wea. FRI. APRIL 7, 1905 Ther.

New Hol grid 325 am

Highlestown

840

Trenton

930

Camden 130 left Trent 1033

Wea. SAT. APRIL 8, 1905 Ther.

Counter marks
211 — at Camden
~~320~~

130 pm
left Camden
" Trenton
420

New Brunswick 555

Wea. SUN. APRIL 9, 1905 Ther.

109 - miles -

130 730 5h31
6
next 1.30. 730

1111 — 5h30 Rm

330, 5.5/109

6/109
18.16

Wea. MON. APRIL 10, 1905 Ther.

[illegible]

[illegible] Ni 70% Bismuth 30
" Ni 70% Copper 30
Co 50% " 50%
Fe 50 " 50
Make the Fe Cu [illegible]
[illegible] Co "
Cu "

[illegible] Co
also the [illegible]
[illegible]
HS for [illegible]

Wea. TUES. APRIL 11, 1905 Ther.

Start full sized drum
for plating -
also Elec furnace to
make connections for it.
Fred will take up part
one of the worst [illegible]
big Cell 3.07 [illegible]
on long Charge.
Remove the nickels
plates + try vacuum
Exports -

Carnauba
[illegible] C 500 [illegible]
22 188[illegible] -
Allen 12 [illegible] 3 [illegible]
Sel Carnauba

Wea. WED. APRIL 12, 1905 Ther.

1 Myristin MP 59
2 Arachidat $C_{29}H_{58}CH_2OH$ MP 85.5
3 Myricyl alcohol $C_{30}H_{62}CH_2OH$
MP 88.5
Hyp. Stearat ester $C_{23}H_{46}(CH_2OH)_2$
MP 73.5
5 Arachid $C_{23}H_{46}COOH$, MP ~~79~~
73.5. Lignoceric acid
6 Arachid $C_{26}H_{52}COOH$. MP 79
identical or commence with
Cerotic acid

Stricke
(A 223 314

Sec. Berand B[5] 9 41
Monatshefte C[4] 7 67 [2 mol]
Rosenheim A. 183 3314

Wea. THUR. APRIL 13, 1905 Ther.

Recipe Cl.
Sample 4 1/10 1% N Y Co
Pamp Sum 1. .24 of 1% "

To soak Cups in Rodewaldt's soln

Chloride Tin fresh - Hot
Aldehyde -
NH Sulphide -
Ferrous Sulphate Hot
KOH & Hyposulphite a
Cerium Hexasulphate
Hypophosphite

also Mercuric Chl in Hot
Ferric Chl in "
NH4 acetate in Alcohol
Ferrous Chl " Warm

Wea. FRI. APRIL 14, 1905 Ther.

Left 5 45 cam

449 miles

Hackelsheim 915

under,

491 — 42 miles

3 hours 30 cam

Left

610 am

510 miles on Cycle

8 am Hackelsheim

10 miles complement to Hr

Wea. SAT. APRIL 15, 1905 Ther.

Nitrate Fe normal salt dis

metal in HNO_3 SG 1.29 [illegible]

take up 10% add equal vol

nitric ac SG 1.43 sol on

Cooling deposits salt, filtrate

Lavender blue,

Thios salt dissolves 2 3 6

8 12 & 24 indicates ferric oxide

add sol in water

Neutral Oxalate Ammonia

dis oxalate Ni - Co (H_2O)

Wea. TURS. APRIL 18, 1905 Ther.

Wea. WED. APRIL 19, 1905 Ther.

Cobalt ores -

Mineral Hill Maryland
in Chlorite Schist with Copper
Cryst 25% Co

At Potapsco Mine near
Finksburg Carroll Co
& at Springfield
Cryst 37% Co 10% Ni -
Called Cobaltite

At Chatham Corners, as
Chloanthite (Cobalt nickel)
occurs in Mica slate
with Arsenopyrite & Niccolite.
Co variable from 3% to 20%

Smaltite, so named for
Cobalt, from the
[illegible]
found at [illegible] in
gneiss associated with
Calcopyrite

Wea. THUR. APRIL 20, 1905 Ther.

Wea. FRI. APRIL 21, 1905 Ther.

Cobalt

also at Jackson &
Haverhill NH,

Redwash Dakota
Contains Cobalt, conditions
Zn/Co —

Some Contends Manganese
has Co, connection Bi/Co

Bibb Co, Contains Cobalt
Cobalt,

Wad - Manganese -
Cobalt, near
Silver Bluff South Carolina
Zn/Co Co Sweet 76/1
Mn O.

Wea. SAT. APRIL 22, 1905 Ther.

Wea. SUN. APRIL 23. 1905 Ther.

Remingtonite, Carbonate Cobalt, occurs as a Coating on thin veins of Serpentine which traverse hornblende & Epidote at Copper mine near Finksburg Carroll Co Maryland

Khetri Mines, Rajputana India, Cobalt ores - (Jeypoorite) (Naipurite) - Records Geol Survey India XIV pt 2 195 1881 - These minerals are Cobaltites, Domeite,

Cobalt occurs in Coal in the earth -

Wea. MON. APRIL 24, 1905 Ther.

[illegible]

Wea. TUES. APRIL 25, 1905 Ther.

2 miles from Bullion 1822
Sand drawing on side road
albinic soil -
in pebbles hard ferruginous
sand the sand is
cemented together by
Cobalt + Manganese oxide
Color black weathering
to blue, slate colour.

In a ferruginous
from Virginia Co. is
found

Wea. WED. APRIL 26, 1905 Ther.

Rocks from Hardy vein
on West side Thunder Bay
Commodore vein carrying
properly silver & Native silver
& some Cobalt, — Huronian
Talcose rocks,
Vein Composition Native Bismuth
Native Tin & nickel here
2 ft. wide.

Co-Ni at Jackfish Lake
at Shebandowan
ore containing the Co-Ni Comes
from Huronian Bay where there is
a promising vein carrying 9 to 10
% Ni & Co — $140 in silver.

Ni & Co have been found — the
Mangamese deposits
of Eastern Canada in Gaspe Co.

Wea. THUR. APRIL 27, 1905 Ther.

Perma Survey Vol Chem and
p. 194 from ore opening near
Dactilla on North W slope
of Jack's Mountain — Grounds Tourmaline
Botryoidal —
25% Proto 7% 27 Ferric & Proto
Hematite
Co_2O_3 0.580

Blair Co p 197 McCreath Rep
Chem and
Co_2O_3 0.116 Baker ore Bank

p 209 — Chestnut Hill mines
Co_2O_3 0.185 .130 . 047 . 066

p 213 Trenton RR Co mine Trenton
oxide Cobalt. 0.390
has some peroxide

Wea. FRI. APRIL 28, 1905 Ther.

p 218 Saucon Iron Co mine
0.140 Co_2O_3

p 371 Cellular Quarry
Co_2O_3 0.170

Smelter Val McCreath
Per Year Samples
p 1 = Franklin Co -
Richmond furnace mine -
Co_2O_3 0.390. McPleasant
Beaver 0.130
Co_2O_3 200.

Page 2 Carrick furnace bank
over Co_2O_3 .280
Railroad bank. .280

Page 3 = Geo Weinmann Mine
Co_2O_3 .390

Wea. SAT. APRIL 29, 1905 Ther.

p 4 - Webster mine
Co_2O_3 0.510

Stinger Mine, 0.390

Garlic bank mine 0.120

McCleary .180 Geo Rock
0.130 Pass orchard .190

p 6 = Mill bank
Co_2O_3 .240

p 7 = Mont Alto Iron Co
mine 3 Co_2O_3 .250
~~4~~ " .250
5 .220
8 .370

Nearly every mine in Franklin
Co got Co_2O_3

Wea. SUN. APRIL 30, 1905 Ther.

p 14 Means mine
Co_2O_3 ·570

p 15
John H Crealer Co_2O_3 ·420

p 18 South Mountain Mining & Smelting Co
Lowell No 1 - Co_2O_3 ·520

P 26 York Co -
Shelly & Haffey Co_2O_3 ·334
Logan ·766 55% of sulphide
Cobalt,

Most of the Wad or bog
Manganese of the Limonite
Beds of Northampton
Lehigh & Berks & Montgomery
Co also Contain Cobalt

Wea. MON. MAY 1, 1905 Ther.

A large deposit of an
Ochreous Cobaltiferous
Variety occurs according
to Prof Roepper [private Com]
near Alburtis Lehigh
Co at the mine of the Nickel
& Reading Cobalt Co.

A Cobaltiferous ore
Containing according to
Theo D Rand 10% of
Cobalt has been
observed by him in
the lower workings
of the Drift opening
Fairmount West Phila.

Wea. ~~Tues. MAY 2, 1905~~ Ther.

~~At Cornwall & Lebanon~~

~~Also~~ Caballeros Wad

in Williams Township

Northampton Co

(Wad at Cornwall Lebanon Co

Cobalt is found at the

Mine LaClatte - & Old

Copper mines in Madison Co

Missouri & also at the

St Joseph Mines Mo

Wea. WED. MAY 3, 1905 Ther.

April 27 1905

Continued from other book

Dyer New York patent idea of

~~bring~~ up pressure to 1600 lb

Crushing point of Cement,

Patent Method of separating the

from Co, by reducing them

Mixed oxides & chlorides and

the Mg by Klg & recovering

the second —

Per of 3 patented from process

of grinding up mixed sulphates

Fe & Cu & separating them

quickly, to the metal process

& anhydrous & then

Oxide Borough by react

then reduce by Mg,

Wea. THUR. MAY 4, 1905 Ther.

[illegible] new groups
15 ~~20~~ 25 ~~30~~ 40 % Cu
with 5 Ag work for 25 + 40%
Reg for [illegible]

[illegible] all the good groups
above 950 —

also some very the [illegible]
group with Cl powder
for Cu —

Group heavier range
on — twice as heavy
+ 500 % heavier —

Wea. FRI. MAY 5, 1905 Ther.

Some device measure
out 5 each environment
of 50 Tumps so all
alike —

Make several groups
with Nickel [illegible]
M on Copper - [illegible] and
by air + [illegible] + a salt
the Cu + Copper —

also passing H_2S thru acid sol
containing phenolsulphonic
sheets - [illegible] by [illegible]
& [illegible]
[illegible]
form of [illegible] + reduce Cu
with [illegible] to stop [illegible]
use same [illegible]
Ni [illegible] as Cu now
used —

Ferrous sulfate also McCallie

Sulfat. Cu in neut sol
alkaline, Metallic Cu
being reduced to Cuprous
Sulfide & air oxidizes it
to the Cupric sulfate.

Copper immersed in Cupric
sulfate solution with
ammonia in dry air
until all the Cupric sulfate
is reduced to Cuprous sulfate
Sol should be diluted with
deaerated water & closed
up —

Very Conc Monosulfide K
attacks Copper in presence air,
forming Cupric Sulfide thus
displacing one atom Cuprous
sulfide & sulphur then it
forms a double sulphide
of Cu_2S & K Sol in the Solution
The action 1st formation KOH &
Cupric Sulfide. then no fact

as formed splits up into
Cuprous sulfide which
further the alkaline sol &
K_2S & Cu_2S & the sulphur
which forms polysulfide
Chem Soc Jul 963
1846 1884 —

Treat flake by KS fully
then ox days the CuS
by K permanganate in
alkali. also by H_2O_2
Appo slo to form sulfate.

Cu Sulfide Combines with
Na Hydrosulphide to
form Double salt Sol
in Na S NaOH,
555 Chem Soc Jul No 52

Wea. MON. MAY 8, 1905 Ther.

CuS does easily on
acidifying which may find utilization
forming Copper thiosulphate all
in solution. HCl is recuperated
in solution

CuS does in ammonia thiosulphate

CuS forms Sol double salts
with Thiosulphates
Thiosulphates

~~[illegible]~~

Hyposulphite Soda does Cu with
the Thiosulphate Copper can thus be
prep by NaSulfide
which regeneration the
Thiosulphate of Na
Salvation solution is due to
production of double Sulf

Wea. TUES. MAY 9, 1905 Ther.

1 litre containing 20 grms
of Thiosulfate for a flavoloum
100 mlg Copper but not
can be continuously run
through a Cu precip by
KS4 Illus regenerated -

Freq HCl Platinic in acetylene
makes Cu acetylide -

Hypanith from 74 mysso-Dried
ash 13.8 %
2.55 ammonia
0.41 phosphoric acid
0.70 Potash -

Wea. WED. MAY 10, 1905 Ther.

... Cabarrus and Lincoln
Gaston Co NC
Prof H Wurtz
Amer Journal Sci
XXVII p 24 to 31

Rogers to make some
strips with more open
under conditions so
Can use 001 to 004
or 005 slide-for
tubes—

will
Morrow to at Fort Oglethorpe
Tenn 17th or 18 May

Wea. THUR. MAY 11, 1905 Ther.

Gaston + Lincoln Co NC – Wurtz.

Talcose + Quartzite shists crosses
south fork Catawba River a little
south of line between Lincoln + Gaston
Co in vicinity of the Falls called
"High Shoals of the Catawba"
This belt many miles long direction
N. 20° E varying in places due N
+ N 35° E at High Shoals in 3 or 4
miles wide everywhere traversed by
veins quartz carrying pyrites
+ other sulphides showing on surface
limonite Gossan Veins all kinds
strike + dip, most important ones
conform to general strike, dips
generally vertical
Proceeding Northwestward from
High Shoals into Lincoln Co along
belt of Talcose + Quartzose Shists
many places seen where Gold mines
Shuford & Carrales mines many
miles in distance but apparently
same range, high elevated with
Graham Ore black, fragments

of Lurvonte Gossan = honeycombed
Quartz constantly seen on surface
sometimes isolated & sometimes
strewn along considerable
distances marking outcrops
In this part of the range the quartz
veins usually contain wherever
opened more or less Galena
Blende & Chalcopyrite usually
with native gold & in one place
nativ

Going southwestwardly from the
river we find the rocks presenting
similar indications & in course of
some 15 miles we encounter
successively the Long Creek gold
mines from the Ashbury shaft
of which much gold has been
taken & a number of places
where Iron ore 10 oz has been
mined known as Costner
Ore bank Allison Ore bank
Ormond ore bank Ferguson
Ore bank Briggs Ore bank

a few miles beyond the latter
not far from the same range lies
the well known Kings Mountain
Gold mine so called. Greenstone
Trap dykes are occasionally
encountered running parallel &
sometimes across the strata
The beds of the streams frequently
contain pebbles of Black
Tourmaline & Black sand
Immense veins or rather strata
of Black Tourmaline seem in
several places usually veined
with white quartz veins of
pyrites found crossing streams
where current washes bare
other places solid banks of
Limonite foreign standing
above ground —

At Allison & Costner ore banks
which are excavated in strata
of ore 30 to 40 ft wide the waste
material was a brown
Magnetite Shist mixed with

Wea. TUES. MAY 16, 1905 Ther.

Wea. WED. MAY 17, 1905 Ther.

much amounts
throughout the whole range
of hills examined.
The talcose
shists were found to contain in
numerous places small
seams, nodulations & veins
of a black substance which
gave blowpipe reaction for
Cobalt.
At all the mines the ore was
coated more or less with
the black substance
at Ormond ore Bank Especially

At Asbury shaft of the Long
Creek mine masses of quartz
thrown out of mine were
thickly incrusted with
mountain, being masses of the
Wad or Earthy Cobalt

It cannot be doubted
but that the Gossan of
some Cobalt fields Sulphides
as no arsenic was detected

Wea. THUR. MAY 18, 1905 Ther.

Wea. FRI. MAY 19, 1905 Ther.

It is soft unlike Earthy manganese smears the fingers & can be cut with a Knife. Exhibiting in sections the lustre of Compact graphite. The Country people call it Black Lead

A Spot about a mile in Northeasterly direction from the Long Creek Mines I found Crossing at right angles the road from Lincolnton to Yorkville in South Carolina where the latter crosses over an Elevation called "Cross" or the "Paysour Mountain". The outcrop of a large vein or stratum of rock which contains very much of this black goosan or Wad It cannot escape the attention of a person travelling along the road as it appears like a broad black band on the side of the hill

Wea. SAT. MAY 20, 1905 Ther.

Wea. SUN. MAY 21, 1905 Ther.

at this spot it is 15 ft wide
a small opening was made in
it 3 or 4 rods from the road
on the southern side & found to be
12 ft wide included between
walls of talcose slates.
It was traced & opened again
1/2 mile southwestwardly
from the road & found to
~~the~~ consist there of a number
of parallel strata separated
by seams of talcose shists
one or two feet wide, the
largest of these strata was
10 ft wide, presenting a solid
wall of limonite mixed with a
little quartz & so compact
that it was difficult to break
with a pick

Following the Corkerville road
southerly from the point
where the vein crosses it
is found interstratified
with talcose shists. Macalumnt

Wea. MON. MAY 22, 1905 Ther.

Wea. TUES. MAY 23, 1905 Ther.

following the vein northwardly from the road the outcrop was found to descend rapidly along the western slope of Cross Mountain & at about 1/4 mile from the road was found a spot where the ground consisted in great part of fragments of black Cobalt from Wad like nebel map. Opening made here was probably lead to interesting & valuable developments. A Determination of the quantity of mixed Oxides of Cobalt & Nickel contained in the Wad at this spot gave 13 per cent

The Cross Mountain Gossan was found by qualitative analysis to contain in addition to Co & Ni —
Mn Fe Cu Bi Zn Ca Al Mg & Cl

Wea. WED. MAY 24, 1905 Ther.

Wea. THUR. MAY 25, 1905 Ther.

Mineral from the Ashbury shaft gave Fe Mn Co Ni Cu Bi Zn Al Si Ca Mg & traces Tellurium —

The substance from Ormond ore bank may be called Coballiferous Earthy Manganese granular & amorphous

Hausmannite gave with HCl deep black or brown solution — The Ashbury shaft & Crossmountain minerals gave deep green solution becoming yellow when diluted which is characteristic when much Cobalt is present

Hellmuth of these veins are opened down to unwatered Zone strike Sulphides Cuboscuni Siegenite & Sulphides of Co & Ni in quantity

Wea. FRI. MAY 26, 1905 Ther.

Wea. SAT. MAY 27, 1905 Ther.

This minerals found at
Mineral Hill Maryland —

Massive Manganese garnet ??
found at High Bridge Jefferson Co

Some development — Nickel
Mine at ~~Pat~~ Hemlock Floyd
Co Virginia —
Arsenic Mine near Rewald
Post Off Floyd Co Va

Madison Co NC near warm
springs belt 8 miles long
1 to 3 miles wide —
Light blue Manganese ore

Caldwell Co NC 5 miles
west of Lenoir, also
Perkins Mine, 10 miles
West of Lenoir
also 10 miles North of
Dobson in Surry Co

Wea. SUN. MAY 28, 1905 Ther.

Wea. MON. MAY 29, 1905 Ther.

Noted locality of Serpentine near
in Wake Co NC

also at near Asheville in Forsythe
in Macon Co Jackson, Yancey
Polk Mitchell Co
forest beds are near
Patterson Caldwell Co NC

~~Also~~ Wad occurs near
Murphy Cherokee Co also
near Franklin Macon Co
& Webster in Jackson Co

large vein of Compact
graphites occurs in Gaston
Co NC

Wapoochee formation
Ga. Mining gold mines
Gravels occurs
near Cooker Gap

~~Also~~ Watauga Co NC
in the Crystalline Schists
decomposed through Sills in Rock

Wea. TUES. MAY 30, 1905 Ther.

Wea. WED. MAY 31, 1905 Ther.

also 1/2 mile W Blue Ridge gap
in Mitchell Co 2 to 4 ft thick
Earthy — also in Nash Co

Jackson Co Chatham Co
in South Carolina
at Dorn Lands near
McCormick —

Noticeable Locality of Mn
near old forge on
Crowders Creek on West
bank Crowders Mountain

Silver Bluff S C occurs on
surface of Coarse gravel
as to Fe from ardenna
has 35% CoO_{NiO}
65% MnO_2

Wea. THUR. JUNE 1, 1905 Ther.

Wea. FRI. JUNE 2, 1905 Ther.

Vein of Porphyry in Caldwell Co N.C. 5 miles W of Lenoir Embedded in Gneissic Slates 3 or 4 ft wide.

Small seam in Town of Danbury Stokes Co N.C.

Red Manganese Garnets are common of great thickness, there are a series of beds associated with Kings Mountain slates at Gastonia Lincoln & Cleveland Co N.C.

Si 48 Mn O 12.8 Mn C 5.6 alt 72 30.44

Blue Limestone forms in Kings Mountain slates, intercalated

Wea. SAT. JUNE 3, 1905 Ther.

Wea. SUN. JUNE 4, 1905 Ther.

Manganese is found in Greenwood Key Ky — Serpentine or rather pericolite is found in Elliot Co Ky

Oxide Co occurs on Brown Hematite or from Chester Ridge 3/4 mile West of Chester Invernon Hemlock Co Penna

Surface of ore in place covered with thin layers Cobalt oxide

full account Proc Amer Phil Soc Jany 1846 IV 239

Wea. MON. JUNE 5, 1905 Ther.

Iron ores of the Shenandoah Valley
many miles show following
[illegible] analysis
[illegible] % 2 O3 %
Co-Al2O3 - .130 - to none
The .130 is from fox
Moniteau Brook Shenandoah
Iron Co Rockingham Co
These ores are in Potsdam
primal formation, Mg Ca
Potsdam Stratum
along a line light ore of alu
to Manganese ores the
Cromore for manganese
Cromora has .354 Co2O3

Largest deposit of [illegible]
for Steel and so. [illegible]
Carroll Co Va
20 miles long

Wea. TUES. JUNE 6, 1905 Ther.

Refers
17th of Prunya
ass.
J. C. Kilpatrick
Union Sta [illegible]
Mean has please in the [illegible]
office.

W A Mooney
Kings Mt V. Mage
Posted about the Country

[illegible] towards
Grayson Mt
1 6039 7/8
1st 6046 5/8 Sample

Wea. WED. JUNE 7, 1905 Ther.

Red Sample to work
The wedge thrust along side wood.

Wea. THUR. JUNE 8, 1905 Ther.

Working Arsenical Ores

Roast, dissolve HCl, add Bleach
then add arsenious to strong
enough ore dissolve keep F
acid keep a dry pulverized ore out
Co & Ni Electrolysis — Conc Sol.

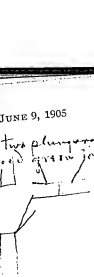
Dissolve ore in H_2SO_4 add Bleach
Keep Sol in Excess, filt Co & Ni
found $CuSO_4$ precip filtrate
& Evap & crystallize keep
solution and distill free
HCl, any undissolved
residue Roast, Conc Sol
neutral Lime Bleach use
Hypo Na —

Make tubes thick flat tin
also thicker 75 double tamper.
all Ni tubes 6 of each
with millboard alternate working
4 trays.

Roy Coffeake 6 tubes 4 trays each
3 trays on before pkg 3 after pkg

Wea. FRI. JUNE 9, 1905 Ther.

Got other ring up two plungers (good) for cake other good green for packing



Johnson's long nut - 75 dentist

6 tubes Ni -

Got 30 gallon still deep for peaches drawer Vacuum pump - make stuff for Moneding records -

3 Frontubes change break water & alcohol pipes wood & pad wood rings - new

Wea. SAT. JUNE 10, 1905 Ther.

Metal flake -

Hyposulphite soda 20 grms to litre distilled 100 mily Metallic Copper - They dipped by Na Sulfide which regenerates the Hyposulfite. the solvent action due to formation of double salts. Can make a continuous system flow using which alcohol works with Tellier Co or the flake made by Copper process

Dust extend over Falls New water jacket but separates -

Wea. SUN. JUNE 11, 1905 Ther.

Gauge in pipe 1½ down
Incr. ~~13500~~ gauge
dille gas 5000
75 Double T 4 rings
Ni Lubes, ½ of 2 each 6
rings before other half
rings after pkg

Plate some 6 strips with Ni
to ash 27 in Ultro H. Cut 6
flake make 6 lubes
75DT - 4 rings 3 offs
ex 3 half pkg

Hopper changes new Sprayed
Double Valves for Kelvin

Wea. MON. JUNE 12, 1905 Ther.

Wea. TUES. JUNE 13, 1905 Ther.

Wea. WED. JUNE 14, 1905 Ther.

New Tubes

1411 Temp rod 15/1000 less 6.575
1412

1413 Temp rod 30/1000 less
1414

1415 Temp rod 60/1000 –
1416

1439 –
7

1442-3 – Hole drilled thru Center

1444-5 Gears filled so Twice as much open
6.602

1446-7 – more filed off old work slow
6.564 – 7.377 –

1448-9 – Spare Tubes 4 rings
6.820.

1450-1 – Spare Tube no ring

1452-3 2400 perf Gears 1/2 filed off
6.200

1454-5 2400 – Gears all filed off –
6.100 –

1456-7 Repairs No 1 perf
6.300

Wea. THUR. JUNE 15, 1905 Ther.

1458-9-Rogers No 2 perf
6,260

1460-1- Rogers 1 perf-both part - at once
6 400

1462-3 Rogers No 2 perf "
6 400

1464-5-6 - Rogers 2400 filed off-
Reg plumps 60 first two - style one
flake 1 wow before green - open

1467-8-9 Rogers 2400 filed off
style 2 flake green - persimmon Lin

1470-1-2 Reg plumps No 1 style - Rogers 2400

1473-4-5 Dup of 1470 - No 2 style -

1476-7-8 Dup 1470 No 3 style
flake still open before green

1479-80-81 - Rogers 2400 - 60/1000 less
than Reg plumps Nickel flake -
Style 1 -

1482-3-4 - Dup of 1479
except style No 2 no flake

Wea. FRI. JUNE 16, 1905 Ther.

1485. Rogers 2400 - Reg plumps
No flake style 1

1488-9-1490 - Dup of 1485 No 2 style No

1491-2-3 Dup 1485 except 3 style No

1494-5-6 - Co - green 1 week before
Rogers - No 1 style - 7,700

1497-8-9 Dup of 1494 - No 2 style 2400 Rogers
7,8

1500-1-2 2 weeks green Rogers Co
2400 - No 1 style

1503-4-5 Dup 1500 - No 2 style Co

1506-7-8 - 3 weeks - Rogers 2400
Reg plumps - No 1 style Co flake

1509-10-11 - Dup of 1506 -
except style No 2

Wea. SAT. JUNE 17, 1905 Ther.

1512-13-14 – Reopen 24 hrs (heavy ground
style 1 – to be changed 10 hours
next 10 hours clear 10 next 10
& last 10 there is slight sugar
rust req therefore +

1515-16-17 Dup 1512 but
style 2 =

1518 Reopen 24 hrs hours off –
10 ~~[illegible]~~ Co flake –
24 green there 60 much fine
in – Req pleasure.
Style 1

1521-2-3 – Dup 1518
but style 2

1524-5-6 – Reopen 24 hrs hours off –
10 Co 24 green there 60 much
Style 1

1527-8-9 Dup 1524
Style No 2

Wea. SUN. JUNE 18, 1905 Ther.

1530-1-2 Co – 10 – green 21
chimney K 3 – there 100 rust
green KCl mixed
Style 1 –

1533 Dup of 1530 –
except very little in KCl to pitch
100 pts flake 30 pts KCl –
Style No 1.

1536 – Reopen 24 hrs hours off –
3.3 Ni flake 8 green 20 –
Style 1 3 sections there lamp –

1539-40-1 – Reopen 24 hrs hours off
9 flake 12 green – 2 sections
put in Style 1 there lamp –

1542 – dull –
5 Ni flake 12 green put in 3
sections style 1 there lamp –

1545-6-7 Dup 1542 except ½ KCl
there lamp –

Wea. MON. JUNE 19, 1905 Ther.

1548-9-50 — Dup 1545
Frost part in 6 inches thick
Temp — Style 1 —

1551-2-3 Dup 1530 — Rain —
10 Ni flakes 19 gr sun & 20 b with
mixed Rain plenger

1554-5-6 new Sectional Temp
10 Ni flakes 24 gr sun — Rain

1557-8 — 2 flat pkts Dup 3 in dia
Snow — Rain

1559-60-61 — Rain —
10 Ni flat flakes —
24 gr sun — Style 1 —

1562-3-4 — Dup 1559
Style 2 —

Wea. TUES. JUNE 20, 1905 Ther.

1565-6-7-8 — flat pkts —
45° Vg Vanardinnfrea —

1569-70-1 —
10 Ni 24 g Rain Snow chicks plenger
Style 1

1572 — Rain 24 gr —
10 Ni Thrott — 24 gr Style 1

1575-6-7 10 Ni 1/2 Chick —
Throtl — 24 gr sun Style 1 —

1578-9-80 — Rain — plenger
Fro 1/2 smaller 10 Ni 24 gr sun
Ni Tunder XXX many wrinkings
Style 1

1582-2-3 Dup 1578 Style 2

1584-5-6 — Rain 24 gr —
Rain plenger clear 10 ne at 10 clear
10 Ni — Style 1 —

1584-8-9 Dup of 1584
Style 2

Wea. WED. JUNE 21, 1905 Ther.

1590-1-2 Pumpkin [illegible]
10 hi 24 green plants 60/two
low - chg 10 rest 10 chg 104
warm [illegible]

1593 Dup 1595 Dup [illegible]

1417-18 potato cuttings chg
2 [illegible]

1401-2 chgd [illegible] 2
[illegible] -

722-3-4 Received Spot
24 hours - or cold
Chem run reg - old
tube - not washed [illegible]
glass [illegible] originally

Wea. THUR. JUNE 22, 1905 Ther.

1595-6-7 Dup of 1467
Run — 33%

1598-9-1600 Dup 1467
except Ni fl Cl Ro
Run — 33%

Wea.	FRI. JUNE 23, 1905				Ther.
	4	5	6	7	
1464	962	986	1010	1025	
65	990	1005	1027	1042	
66	1002	1020	1041	1060	
67	1040	1045	1061	1087	
68	1038	1045	1057	1070	
69	1030	1032	1050	1063	
1470	1020	1020	1037	1055	
71	1025	1023	1042	1057	
72	1021	1020	1037	1055	
1473	1037	1015	1030	1045	
74	1022	1017	1032	1047	
75	1046	1047	1055	1070	
1476	1007	1005	1020	1035	
77	1028	1025	1040	1060	
78	1023	1020	1035	1050	
1494	948	1017	1047	1067	
95	934	995	1025	1037	
96	990	1065	1097	1107	
97	980	1062	1090	1100	
98	912	977	1010	1020	
99	756	850	885	900	
1500	1000	1012	1003		
1	1050	1062	1055		
2	1070	1087	1075		

Wea.	SAT. JUNE 24, 1905			Ther.
	4	5	6	7
1503	1085	1090	1087	
04	1110	1125	1110	
05	1090	1107	1092	
1506	1070	1085	1070	
07	1072	1095	1080	
08	1062	1085	1071	
1509	1042	1052	1046	
10	1055	1070	1062	
11	1040	1055	1050	

Wea. TUES. JUNE 27, 1905 Ther.

Aug 2nd 1905

spring

60/1000 low hole. $\frac{1}{16}$ ft –

Dispense boat springs with flat fixed strip

Wea. WED. JUNE 28, 1905 Ther.

Wea. THUR. JUNE 29, 1905 Ther.

Wea. FRI. JUNE 30, 1905 Ther.

1 = John G'll dissolve into fellow for one tube, the big machine to be an aggregate

2 = Establish test for economy on Lewis's reg mix —

3 = Conclude economy tests on Mr's mix made by varying the mixing

4 = Test economy of Vanadium iron

5 = Group with silk mixed with flake

6 = Make 7c amalgam electrode big size in line — make amalgam electrode with Lot in H_2O —

7 = 7c electrodes with 20 33 4 10% Caffer — also 8 others burning current test with 50% H_2O_2 —

8 = Make Coffin's deal now by non rod under water KOH, by powerful current,

9 = make iron by group 3 dry portion
Electrolytically on block pressure

10 = Make some Cobalt same way as
w2 make iron, oxalate & ch reduction
by H2 test with iron as exhibition
of Co.

11 Make iron by igniting the hydrate,
also Nitrate K2 Nitrate Fe

12 Free Sulfide Fe with K Nitrate

13 Fe pockets with Fe made iron
Nickeled iron in iron pocket

14 = Group Tubes ~~Hg~~ pkg iron
NP
Co 8 =

15 - plate Zinc on Magnesium plate
from Zn KOH + Sulfate K -

16 = Group test ~~chem~~ dry pkg
Charge 10 test ~~Fe~~ Ele with
4 lb - 4½ x 5-26 drop 15 -
Sections -

17 Work wood group fine test
part of Cobalt chg a very ½"
in 75%

18 make some dioxide of Fe +
from Fe O with KOH by Electrolysis
O

19 Finish by heating the iron oxide
burning sulfur + [illegible]
with Bromine into prevent forming
Ferric oxide

20 Pock Tube with iron made Fe S
7 + 3 Ni finke + alternate
also Ni Bisulfide Fe
also Fe S + Hg O - [illegible]
Magnet sweet + bismuth prove

21 Ir 1x with Reg Fe may 19 20
+ 30% Cadmium hydroxide -

22 Make Cd hydroxide + Hg
pocket. diff. ~~Hg~~ Cd
Nickel oxide + Hg
also ambrosium Cd + Hg
test Co alum

23 Try Cobalt flake strips
20 [illegible] also 60 [illegible] wide
Cut Ni flake [illegible] Ni

24 3 packets with 7 & 5 + only reduced
5 by K [illegible] packet
not well, [illegible] 2 [illegible]
[illegible]

25 group with black [illegible] Ni
[illegible]
[illegible] with
[illegible]
Chg to rest to do Boat Style [illegible]

26 See of plate, 7 & 5 [illegible]
5 [illegible] K in Rott
[illegible]
[illegible]

27 Try regenerating old cells
Chg to rest 10 & to [illegible]
40 hours chg

28 New group boat style pkg
Chg to rest 10 chg 5 10 rest 10
Chg 5 rest 10 6 hours
5 rest 10 — also Ni flake

29 Dup of 28 but [illegible]
[illegible]

30 [illegible] of 28 Boat, [illegible]
Ni flake Cup

31 [illegible]
dup. [illegible]

32 Jacks packed with 7 & 3
[illegible] 20
[illegible] in Cobalt [illegible]
[illegible]

33 Inspect Battery building

34 See Billy Bee

35 group with gratings
pure Nickel

Wea. WED. JULY 5, 1905 Ther.

36 Answers [illegible] Circular [illegible]
for last [illegible]

37 = Arrange to take up
Calabrese [illegible] work

38 = 1½ [illegible] Baked sheet
for [illegible]

39 = Find out limestone condition
at Cement [illegible]

40 = See Condition Cabell plant
[illegible]

41 Relative [illegible]
[illegible]

above [illegible] No. 6713 6714
without Hg gives 1st run
1300 av

No 6699 6700
gives 1766 - av
with Hg —

Wea. THUR. JULY 6, 1905 Ther.

Dyer - Have complete Volume
of English & German patents
See Thomas for [illegible] Bell

[illegible] now 126

[illegible]

See Kolb - Have Ulmup -

Vanadium free iron shunts
on 2nd run - Have Rudolph
make some non pyroboric
see if it aint good if
aint [illegible] Thaw.

Wea. FRI. JULY 7, 1905 Ther.

[illegible] with KOH, to white and colorless if no trace O –

Could make plates plate by adding [illegible] [illegible] – with [illegible] –

also Fe Vanadium free
Change Ulrich's Chemistry
Wood & Ethel day &
reporting [illegible]

Look at Curves of Fe where used
light – medium
& heavy pressure
not press –

Wea. SAT. JULY 8, 1905 Ther.

make some Fe plates like 100 also Copper
OX plates – Use
Oxalate Iron mix
with KOH – pressure
heat, also moulded
with grid in Cantlay
(1e) piece if perforated
1905 Iron

Test Economy on Fe
pockets 3 g 4.5
+ 6 gram –

Test Copplated tube
with Fe – Economy

group the
old Reg of Woods
map but now square
feet 150 section —
Thus 60 & Thus 40

plate Th 7 Th 7
1/1000 — Thus cut up
.005 squares —
make a tube —
or pocket —
also Ge — tube
Co Fe —

Make photo of Iron
Iron in click
& reduce by
Current ado of
Coherent.

Melt oxide Iron
probe —
also Mn of 75 Fe O
& 25 pt. Co O —
mother together

Wea. Thurs. July 11 1905 Ther.

Run Cat Ni plate
00010 1 hr 40 –
It seems to better

Melt Ferrous Ox
in plates, reduce
by H, self heat,
also with grid in

also melt Cobalt
oxide + pass over
indicator plate.
Reduce by H,
self heat.

Wea. Wed. July 12, 1905 Ther.

Dr Smith see if any
Ag in last rotten
Quartzite from
Wilson –

Melt some CuO
in Oxygen leal,
Vulcan, Leland.

Try Reg Fe in
Iron pocket not
Ni plated –

Wea. THUR. JULY 13; 1905 Ther.

Precipitate Fe SO4 [illegible]
by Ammonia [illegible]
[illegible] dry then
[illegible] & [illegible]
press on [illegible]
& test in pot
also wet with KOH
& ignite to Coke [illegible]
test

Try no binder for
ferric from Oxalate
Mount ferric hydroxide
ignite — & Reduce by H.

Wea. FRI. JULY 14, 1905 Ther.

Wheatstone bridge. OK. gal 1060

group 500 mily 500 "
" 1 000 "
2 000 "
4 000 "
10 000 "

Economy etc - tests

Lifter machine for Tamping
is OK & can make tubes
every time around 1050

Put group 5 up with
Cutting Irons Reversing
twice every 50 Revs
Co flake —
Ditto Nifflake Thro H

Wea. SAT. JULY 15, 1905 Ther.

Mould around a crucible with bare, 3/0 alumina ferric from oxalate reduced by H + heat — Water — Vanadium & Tungsten free

ditto but trying to get non-Hydro state,

~~ditto~~

Take ferric Va + W free mix sulphate & nitrate equal 30% of the iron — separate + reduce by H Requires very acid heat, no Hg —

Wea. SUN. JULY 16, 1905 Ther.

Reduce oxalate Fe by H to get pure alum powdery —

Test Permanganate Reg Fe

1 gr — pkt 2 gr

2 1/2 3 3.5 4

4.5 5 6 7 10 —

gr to Cuvs Reg pkt

Wea. MON. JULY 17, 1905 Ther.

If plate wrong has
contact in center
then the last point to
reduce will be the
outside & be resistor
therefore better zoomy

Above ought to be
good for Lelands
plates —

Test zoomy (here)
CuO in OH in
Leland —

Wea. TUES. JULY 18, 1905 Ther.

Test 7z cell with non
pyroporic plate
previously freezed then
reduced grid inside
test Hot to get it oxidized
again — Va + WO free

Another one change
H at 40 hours —
WO + Va free —

Tell Dr Grothe that
something in 7z that
makes what Low. when
you non pyroporic —

Wea. WED. JULY 19, 1905 Ther.

Rogers make some
oos stock 2400 –
cylst

Rogers also make
some with say 2000
but run across stock
to give strength to
tube oos

Wea. THUR. JULY 20, 1905 Ther.

To pocket charge it fully
40 hours
take out put in water
Soak couple hours
Let it self heat fully
Recharge & test,
then recharge a gum
& self heat in glass
& Recharge & test

Take my coat of old
plates sent over by
Rogers 240 ohms
pass me.

Wea. FRI. JULY 21, 1905 Ther.

put tube 1/32
outside diam 7 2
125 / 1000
packed in
split mould
nothing on
outside long inside tube.
Nothing put in plug

Spread put in
inside plug
Thermometer
packed & closed taken out

Wea. SAT. JULY 22, 1905 Ther.

put 2 changed irons
in long one outside
1 inside off from
Cup put 33/. on outside
21/. see off of off of
Valleys

ditto Ni in 21 7 2
in 33/. —

ditto Ni in 33 7 8
in 21/5

Wea. SUN. JULY 23, 1905 Ther.

Try economy in Cutting
Rods — See if Rod
has any with higher
Copper —

5 Ferric oxide —
Wet with Sulphuric
Decomposition. Have reduced
by H_2

Finely divided Tungsten
has to be pressed and
[illegible]

Wea. MON. JULY 24, 1905 Ther.

See if Ralph wear
Distilled water to
Self heat Tpr

Try Economy with &
without Vaseline

Ditto with
14% 20 25 33⅓
Copper + 4% Sn
increasing up on that
proportion to Cu
increase —

Wea. TUES. JULY 25, 1905 Ther.

Try reducing Fe
in 250 500 1 2
3 & 5 grms
Bromide K — KOH,
its easier decomp
than KOH —
it allowed big more
before

Charge New pipe!
Fe — in KOH
at 1.75 take
200 of 600 cc capacity

Wea. WED. JULY 26, 1905 Ther.

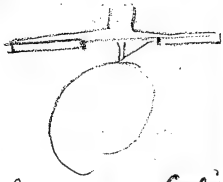
Try group 500
Melt Iodide K —
Ni alloy Cr flake
Never tried it
with flake Co Ni

Alloy of Fe + Sodium
Melt Fe in Electric
arc & Throw in
Clean Sodium to make
20 @ 30% alloy
put in crucible
allow it decompose
decomp of nitrogen

Wea. THUR. JULY 27, 1905 Ther.

Dyes mothers [illegible]
Cement patrol

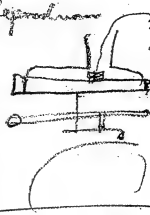
Wallace Miller



Reg dia as a Cyclin
to a dia Twenty
large

Wea. FRI. JULY 28, 1905 Ther.

Reproducer



Ralph - make screen
45 % Cu 50 % Fe
5 % Hg

Make 2 grids 8 inch
10 atmos Smooth + flat
40 [illegible] 4 300 [illegible]

Make lot of 7½ Cakes from oxalate, heavy press also light press – has water. Ignite to white. Soak various Copper salts, ignite some zonte more than once & ignite. Test direct – also reduce some in H at various temperatures –

dates in 1/2 Carpo

Some cakes reduced more porous – then recycling in air alone temp fell fully red or temp dropped little Copper so reduced

Reverse warm air Low E 18 press dry spring it 6 each – 2 W Lake 10 bbl R 30

Dr to make Oxalate temperature

~~Uranium~~ –
Molybdenum
~~Chromium~~

to be reduced in ~~H & Hg~~ or 50% Copper added before reduction

Lost to ~~Osgood~~ ~~Wm~~

No Cadmium 50 Cu 50
5% Hg

Wea. MON. JULY 31, 1905 Ther.

Ralph - make some
Cu 60 Fe 40 — Cu 70 Fe 30
ditto with Hg 5%

also Fe 60 Cu 40
Fe 70 Cu 30
ditto with Hg -
get Curves

Take second alloy
group 300 to 350
Rhu, Vtal work
lost [illegible] 1 [illegible]
+ Recrystal [illegible] 1 [illegible]
1/2 to 2 [illegible]

Wea. TUES. AUG. 1, 1905 Ther.

Drop all the
groups 3 to 5 lbs
Co also Ni -
+ chge 10 rest 10
Sto -

ditto Hot,
ditto 1st reverse
36 hours Hot,
then chge 10 rest
10 Sto - 1st work

Wea. WED. AUG. 2, 1905 Ther.

3 to 5 lbs grainings
2nd washing
dilute gold solution
dilute Reg
Mix with Reg Mix
platinum —
dilute palladium
d

Wea. THUR. AUG. 3, 1905 Ther.

Change & then
thoroly discharge
pts. + elements
KOH, by H_2O +
ethyl — then
soak in Chloride
Conc of every
metal to get
Calalysers

Wea. FRI. AUG. 4, 1905 Ther.

Calculation showed
Oz mixed with
Copper + Copper Hg
rows also -

possibly reduction
takes place by K
hence after Oxalate
Oxalate reduced
different reach
make - hence
Oxalate showed not
Oz ignited but
reduced by H -
with 50% Copper
in

Wea. SAT. AUG. 5, 1905 Ther.

possibly double
Oxalate Fe + Cu

try Double of
igniting + also
reduce by H -
also burn
Oxidise by Chemical
means

possibly the gas Vallage
not Oz to the Stadium
nitrogen formed with
the free Hg - possibly
with 50 Cu 50 Fe
no Hg-gas V disappears

Wea. SUN. AUG. 6, 1905 Ther.

See chg Curve 72
5% 10 15 21
33%

Gerrit Inc Oxalate
wet with Juniper
Chloride + Redby
H, also Juniper
Ammonia + ignited
+ Redby H
also with Cu

Wea. MON. AUG. 7, 1905 Ther.

Hooper newspaper,
2 weeks but the
very old tubes
restocked today

Weather Mullen
Regulable table
table in Recorder

Wea. TUES. AUG. 8, 1905 Ther.

XYZ

Expose all fluorescent [illegible] to acid vapor with all kinds of salts of all the metals

Make salts of all the metals + then - put - the Ray photo plates for 2 plates

Then make sheets of Every fluorescent color deposited on the plates on the metals Slide + photo 2 [illegible]

Wea. WED. AUG. 9, 1905 Ther.

Ferric oxalate in ~~[illegible]~~ [illegible] yellow [illegible] gray - [illegible] + [illegible] must be strong [illegible] -

Make some Oxalates of ferric from Oxalate [illegible] Sulphate Copper Iodide to yellow with a shark [illegible] - 2 1 Soak 2 2 Soaks 2 3 Soaks Zinc Sof -

Isolating Ferrous Chloride into red hot Hydrogen

Save the HCl to red or fresh iron, Carbonium process - powder full down into water [illegible]

Wea. THUR. AUG. 10, 1905 Ther.

Reg reps to Charge pans now in 21% at 100 125 150 175 pans fresh once for 3 each temp — use Nickels 2 pans results

also charge with strip in 21% KOH, pans now at 125 150 175 212 + then put with fresh chgd Nickels + develop and see results,

Wea. FRI. AUG. 11, 1905 Ther.

before discarding a group of units discharged - ~~[illegible]~~ dry them at 350 7 hr 12 run —

also remelting part of percolate next KOH + dehydrate at 350 7 hrs used to say that units dried in oven after taking out of battery run better then 2 days - probably due to Negative Conditioning + then becoming active on delay

Wea. SAT. AUG. 12, 1905 Ther.

Dry pulp to form a
wash of decomposing
O vitals Fe at lowest
possible temp —
It will the O more attracted
to K or H on charge

also the pure ferric
ox by dry process
dehydrated by air process
to get the O most in order
to reduction —

Lord Rosse makes Cocoa by
process Fe304 ferro and
debits by ammonium
wash & press thru
cloth on leg drain to
till nearly dry then steam

Wea. SUN. AUG. 13, 1905 Ther.

at a heat very dull red in
dark.

Watts 395 from very ferric
hydrate Co. to Co dehydrated
dehydrated at 160 to
200 C. at, in a saturated
Sol of Ca Cl or NaCl,

Wattsing ferric hydrate
dehydrated by low
red heat,

Try some FeS
Roasted free S at
lowest temp —
also high temp &
powder before Roasted
200 mesh —

Wea. MON. AUG. 14, 1905 Ther.

Letts from signing
the Nitrate -
also from signing
Double Wells having
smallest quantity
giving satisfactory
results, Set Double
Extension etc -
To get Improvement
considered -
by Journals etc -
Letts " " Work

Wea. TUES. AUG. 15, 1905 Ther.

Make pocket filling
with Excessively
leaky Copper solution
by Current Washer
then fill with force
by small scissors clips
delightfully cools
time very hot
Temp -

J C Pfeiffer & Bro
General market
900 Bloomfield st
Hoboken -

Roast	10 lbs	18	
Steak	3½	35	680

Wea. WED. AUG. 16, 1905 Ther.

Pitch - Chatfield's [illegible] Cartlinger Office

Kopak No 30 [illegible]

Raven [illegible] Mining Co of Texas - [illegible] Nelson Corporation

Asphaltic Pitch made by Water - Pierce Oil Co at their Texas plant

Asphalt - Gulf Refining Co Port Arthur Texas

The Arthur C Harvey Co — 375 Compressed Norway Sionn Iron - By stock

Wea. THUR. AUG. 17, 1905 Ther.

Asphalt Mr John McNeal Casper Wyoming

Wax Tailings from Mandand Oil C

Wheelock Lovejoy & Co 23 Cliff St NY

Importers [illegible] Swedish Norway Iron

Horace T Potts & Co Importers Swedish Iron

Ozocerite.
Mr Kronpa
Provo City
Utah

Ask for Samples & price. at RR -

natural Hg Electr with Iron - press in Chamois Hg out Put in pkts Hg press dusty or nothing gets out.

detts and - Cu Cd - Co Ni + other metals in dif proptns

Ethyl Sulphuric a. $C_2H_5SO_3$ is the radical

Dry Crille Ducts, of Ricks,

Dry alcohol Methyl alcohol Dissociation power 1/3 of water - Antiseptics

Wea. TUES. AUG. 22, 1905 Ther.

Change group in
water with only
10 milgrms KOH in
solution – Then
before descing peel
in 21% solution
another group
change in 21%
soak in water 1/2
hour then put
in fresh water
in descing –

Wea. WED. AUG. 23, 1905 Ther.

group with 12 grms
acetone –

group with tubes
washed by capill
by dipping ends –
KOH & remain
in closed jars
4 hours to completely
fill with KOH &
displace air –

Wea. THUR. AUG. 24, 1905 Ther.

[illegible] worked on
[illegible] with Ethyl.
Then dried [illegible]
[illegible] present
Ethyl [illegible]

Ralph Wake [illegible]
[illegible] of CP Cab [illegible]
Reduced 6 pt. [illegible]
[illegible] Reg [illegible]
[illegible]
— Economy

Wea. FRI. AUG. 25, 1905 Ther.

[illegible] for 2 [illegible]
after 7½ [illegible] Chlorofo[illegible]
Soak in water ½ hour
& then proceed with
Ethyl [illegible] see of V [illegible]
by deducting the KOH
forming in Ethyl —
detts Reverse of
this in Ethyl —

Test recovery of Ecll
in Minimum KOH &
Maximum Mon free
[illegible] on Loops in [illegible]
[illegible]

Wea. SAT. AUG. 26, 1905 Ther.

Prepare Hydroxides of
Ni distill Fe by
using Ni as anode &
Ni as Cathode —
agitating liq
using NaSO4 —
or K nitrate or
NaCl — KNO3 gives
Fe2O3 Hydr NaCl
FeO Hydrox

Test running Fe pkt
in NaOH

Wea. SUN. AUG. 27, 1905 Ther.

also in 21% KOH
with 4 grms Rubidium
Hydroxide — as dis from
Hydroperox

Realize dissolves in
KOH Solid —
Why not quite zoomingly
Coefficient with Sulphur
in KOH, + dissolves and
Realizes —

Wea. MON. AUG. 28, 1905 Ther.

Reduce Mixed precipitate or ignited Sulfide Stuff washed containing H to no precipitate state.

Mix of 30 Tin 70 Fe
" Sb 70 Fe
" Cu 70 Fe
" Bi
" Ni
" Co
" Cd
" Zn
"

also drop weighing to each 5% =

Or furnish Oxalate Cobalt to RA to reduce by H weighing

Wea. TUES. AUG. 29, 1905 Ther.

Carbonate to which S is added if fused with Arsenic the metal remains as sulfide free from arsenic — Coatts possibly charcoal should be added

Plate Fe pockets with Cobalt instead Nickel —

Wea. WED. AUG. 30, 1905 Ther.

Charge 1/2 d oz. 5 gm
Reg Nitr Fe 4 days
Continuous + then
put up to level of
Economy of Copper

I set down decided
below Volt
another not below
1.2 Volts —
dissolution to 90
condition by hand

Wea. THUR. AUG. 31, 1905 Ther.

Chg 3 Reg Wires Each
2 days
4 "
6 "

Take 72 with
30% Cu 70 72 + 5 HgO
open after charge
1 after discharge

Holland found out
if big pot on gas decided
to fine 72 or Hi

Wea FRI. SEPT. 1, 1905 Ther.

Dr Goethe

Reg 7c mix with [illegible] 2'

Mix @ 40% Co_2O_3 Hydroxide

dried - provided for below —

ditto — Co_2O_3 " "

" " Mn_2O_3

30% Cu " " " "

Take Oxalate form

Mix so that is 42%

following sulphates used to obtain

(Long Ralph

Sulphide

used by Hydrolysis

No Hg

Sulphate	Co	Mg
"	Ni	Tungsten
"	Ce	Zirconium
	Mn	
	Sb	

Mo
Wo
Ur
Ce

Wea. SAT. SEPT. 2, 1905 Ther.

Sulphide Ba

Oxalate Lime.

~~Oxal Ba~~

Sulphide Lead

Sulphide for photo emulsions

Cu " Ba

" " ~~Sb~~ Lead

" " Cu gray sulph.

arrange so ferric above in

Contact with the anhydrous sulphide

before reduction — H not

allowing the Sulphide to act as

a Combustion —

Try a Cell in strong Sulphide

(Silver Sulphy) Potash + secondary

it does — add S to KOH + use

a Voltaic Series Sulphur

Sulphuretted H by electrolysis using

Nitrous acid by [illegible]

known per hour

then $PbSO_4$ HCl

Etc

Wea. SUN. SEPT. 3, 1905 Ther.

Working Smelting
Roast then reduce to spongy
powder & put in boiling Sulphuric
It will oxidize the rest to Ag_2O_3
which Volatilizes & gives CoS or
Oxide –

Pass SO_2 (at least powder)
Dissolving CoS formed & Ag_2O_3
Volatilizes – 1030 HU infusion
of Ag and $SnCo$ 175 Ag_2O_3 1547
whereas SO_2 only 710 HU.

Roast sponge to Ag_2O_3 Co –
pass CS – Ammonium oxy reduce –
Oxy & combine with Co & Ch,

Impure group precipitate
of K ClO_4 fuses in oxy
non than Cl which is
fast

Wea. MON. SEPT. 4, 1905 Ther.

K is packed moving towards
con –
Na slower & very much slower

Group – 21 parts, 4 grams $NaOH$
" " 8 "
" 17 "
" 2 grams $LiOH$
4 " "
8 " "
12 " "

Group 23 parts KOH
" 25 "
27 "
29 "

Have 1 group 4 grams $LiCl$.

3 mins of gas

Wea. TUES. SEPT. 5, 1905 Ther.

Group Sulphide Na
" " Li

Manganese Salts of Na
[illegible]
[illegible], Tally marks,
not sol.

Dip electric Cobb wire
in long glass pt permanganate
of potash. Make hot with
5 solution of pt acid [illegible]
of K. - Record -

Wea. WED. SEPT. 6, 1905 Ther.

Relative affinity of Sulphides
for metals

Strongest Palladium
Mercury
Silver
Copper
Bismuth
Cadmium
Antimony
Tin
Lead
Zinc
Nickel
Cobalt
Iron
Chromic
Aluminum
Weakest Manganese

Salt, Decomposed and
distill off Arsenic
Sublime —
fuse — from K5 —
$CaCl_2$ — acf.

Roasting Roasted Smelt
in HCl — oxidizes
must HCl just
little more — then
reduce the arsenic
acid to arsenious
by SO_2 + crystallize
out by neutralizing
the Solution —
+ heat liquor
+ add to Ores in Sulf —
Can get by Bleach —

Roast Smelter,
Oxidize to arsenic acid
Then dry + mix with
Salt fuse, add
$CaCl_2$ + Partsmuth
add HCl,
free arsenic acid
+ Reduce by SO_2
Crystalize out,

add by 150 Soda
to roasted ore
+ precipitates CO (OH)
+ arsenite soda
filter off
~~Arsenic to Arsenic~~
~~by SO_2~~

Wea. SAT. SEPT. 9, 1905 Ther.

put washed out in
strong hydrop—
Heat & pass SO_2
to reduce arsenic
to metal + dissolve
Co + Ni to Sulphids
filter off—

Soak some Reg
green in saturated
sol of N_2O_3 in
NH + NHCl, dry
~~of green not~~ out
group—

Wea. SUN. SEPT. 10, 1905 Ther.

Lets Chloride — Methyl
dry — then precip by
KOH boil in lights
KOH, dry!

See Greenlay in re.
Hg/Bleach Prm —

Soak green in acetate
Lead, precip by KOH
boil slight acid
KOH, dry

~~Soak~~
Precip green with
Lead.
Lets Anilin see if
acts like Bi

Wea. MON. SEPT. 11, 1905 Ther.

RH – precip NaOH by
ROH instead NH
See up at 10 p.m. [illegible]

Precip from Chloride
by Na also K

ditto precip from
Nitrate by K + Na
Ditto Oxalate –

precip reg in boiling
ditto decanted
& afterwards [illegible]
to get Basic [illegible]

Wea. TUES. SEPT. 12, 1905 Ther.

Precip Carbonate –
afterwards precip
by Na + boil –

Precip Chloride from
Methyl ditto
Ethyl –

Sketch RA [illegible] by
electro Hg & precipitating
[illegible] by K & [illegible]
Hg – [illegible] Oxalate [illegible]
[illegible] & [illegible] off &
[illegible] Hg –

Try KH, 2 parts Arsenic
Hg Chloride depos
Chronic — then
remove the [illegible] & will
or heat albuminates as
in Cl_2 O_3 =
The black arsenic powder
melted on gum & drying
was [illegible] practically
pure —

Try mix with Hg to
mix to give 4 lb parts
Ag, one part in form of
oxides — to form the
Staple Silver amalgam

[illegible]

30 arsenic
5 [illegible]
60 [illegible]
60 Carb Soda
[illegible] leaves Co as OX + form
[illegible] arsenite —
of OK — [illegible] a bromine
[illegible] & Carb will get
right movement —
[illegible] arsenite
30 Sulphur
60 Carb Soda Salva

Try roasted ore [illegible]
[illegible] Chromate Soda &
[illegible] oxide —

Wea. FRI. SEPT. 15, 1905 Ther.

New process
Co Ni anode Hg cathode -
when nearly [illegible]
draw off + let it
oxidize Co will
oxidize 1st then nickel
doing it twice or 3
times should separate
them - to Calculate
the oxides

Wea. SAT. SEPT. 16, 1905 Ther.

Roger Fred Oil in also
some Eglat 006 leaf
prune rall some flower
make 6 — prunp

Make some Wm pickle
same or 005 + taste,

Roasted Smelter
Salt, melt + add Co
Ni goes off
crucible Na remains
or use Mag Na + Ca

Spern ~~[illegible]~~ in arc
furnace with Mg
lining

[illegible] Uranous [illegible]
[illegible] oxygen
[illegible] Reduced [illegible]
[illegible]

Try chromic acid
w KS also KS polysulphide
use Ni Cathode
from ret anode $NiCoS$ +
Reagent which does always
+ ready deposit as of
Cathode, Can use a Cath
to keep the powders up [illegible]
The CoN with little nickel
Can then be method to
a Spongy anode for
Operation we find
what all chromic acid
then CoS NiS roasted to
Sulfide + pump [illegible]

The sulfides equivalent to oxide
+ CoO dissolved by dil
H_2SO_4 in which NiO is
almost insol —

OV Can be reduced + melted
to anode + deposited by H
as analogous + allowed
oxidizing in oxygen and the
CoO + Fe OH_3 1st
2 repeated + [illegible] in order if
pure enough —

[illegible]
[illegible] from [illegible]
[illegible]
others [illegible]
[illegible] — [illegible]
[illegible] [illegible]

Try — this refers to [illegible]
[illegible] of Co oxide along with
[illegible] — from [illegible]
1st from the anode

Cheap H_2S —
SO_2 passed thru with steam
thru red hot Charcoal
approximately theoretical
SO_2 reduced to S by the Carbon
Water from with sulphur
Carbon H_2O CO the H_2S combines
to form H_2S Carbon kept
red hot by supplying hot air
at intervals.

Another scheme: action CO_2 on
Sulphide of Sodium —

another scheme
Producer gas passed over hot
pyrites — by action of the producer gas
H_2 hydrogen on the pyrites upon the S
Evolved from the pyrites H_2S generated

Very action of ferric chl
on roasted Pyrites
Acc of As goes to arsenate
at ferric chl reduced to
ferrous —

Phosphorus Pentoxide
Strip in Impure Chl s of
arsenic thrown down by
Caustic Lime or oxide Cu

Impure Electrolytic work of the
Newark Sulphate Copper Nickel & Co
Crystalized, the Arsenious & B_2O_3
are yielded on boiling mother liquor
Chicago blue stone crystalized out
Mother liquor Sump colour mix of
blue stone & arsenious
comes out. The mix of As_2O_3 &
$CuSO_4$ is cut with great trouble
Water to obtain the $CuSO_4$
+ Na_2CO_3 —

Pontchartrain — Casey Copper
Mother liquor treated by
thrown down Cu in Filter
mixed Cu + 60% arsenic
colour sent for arsenic &
Gross Company smelter

at Mansfield
with stirring 30 ins mag fer wash
from Sulphate Solution –
Arsenic is deposited in spong
state at this low density
while Sulphides of Ni Co are –
Crystallized out of any Copper in
the deposited with the ass
spongy – the Cu is then dissolved
out of the arsenic by weak
H_2SO_4 –

Try Thiosulphate Soda on Smelts
also roasted ore –

Try Smelts anode
Chl Soda with little
free HCl, keep stirring
well –

Reason NaCl destroys with
the Na precipitates the ass along
with Co ass first ass formed –

Try Chl Calcium this will
deport Calcium at Cathode,
a pure chromium –

Then, Sol when saturated
with As_2O_3 CaCl NaCl
Can be Electrolyzed by
Keeping stirred while passing
As_2O_3 on Cathode,
or crystallizing Co Ni Cl
out with Mother
Liquor free Co Ni –
The next to last Mother
liquor put back in
Electrolyte –

If the mud from NaCl
which is mixed Co OH Ni OH
+ metallic arsenic

the NaOH + COOH possibly
be dissolved out with
weak acid, say HCl —
as I do not think the Co
is combined,

I have washed Barly
HCl — with excess acid
& Coagulating + see how
free Cathodes do the are

also Electrolyze with
platin anode
No Cathode get ab out
of Sol —

Send for acheson
Carbon + process
pages the order dat
graphite anodes

Can reduce Co from
Very Cold solution of
Chl with Zinc very
little Co will dissolve
+ no ni —

Electrolyze NaCl with free NaOH
& carbonate
the liquid until all is
Hypo — then put into
another Cell with smaller
anode + this will give
arsenate — + the Co will
be thrown down as previously

also use Na + NaCl
together as Electrolyte
with arsenic Anode
1st Electrolyze so to get it
Hypo of nickel

Wea. MON. SEPT. 25, 1905 Ther.

fixing up chemroom up
& ready for Electric Work

[illegible] to pump.
[illegible] H_2O_2 [illegible] to [illegible]
No working
day [illegible] [illegible]
[illegible] +
[illegible] it to run
[illegible] up —

about to make a
[illegible] washed
with an [illegible]
[illegible] phate
[illegible] —
[illegible] heat +

Wea. TUES. SEPT. 26, 1905 Ther.

Auto 2.0 [illegible]
Wind Rev 10 miles 7.366
20 " 29.2
40 116.8

[illegible] copper [illegible]
Arsenic used in
Salts of H_2SO_4 Sol.
[illegible] Cu
[illegible] be [illegible]
[illegible] + used [illegible]
[illegible] up w/ C. [illegible]
[illegible]

Wea. WED. SEPT. 27, 1905 Ther.

Cost of producing Fe_2O_3 to
Metal at Silver Lake
Cost of Hydrogen
from 41615 lbs 1.725 c 718.
H_2SO_4 12 lbs 72155 lbs 721.
Sundries 3.
Labor 22.
$FeSO_4$ produces 112 424 lbs = 816.
Metallic Fe produces
162220 lbs · ·103 Cents lb
for Hydrogen
Reduction Cost Labor ·0295
·0022
Sundries ·0074
Coal ·0391

Total gas ·103
Reduction ·039
Cents 142
142 Cents lb

Wea. THUR. SEPT. 28, 1905 Ther.

Wea. FRI. SEPT. 29, 1905 Ther.

Bismuth Notes
Uses for Bismuth
One deposit of importance in Utah
Oil or gas found at Phoenix Arizona
[illegible] in Cassiterite quantities in
found in Boulder
Carbonate Ores in Boulder
& La Plata County Colorado
Bismuth Queen Lode 5 mi
from Golden Colorado
Vein 2 to 8 in width, mostly
nickel ore seen on Bismuthite
Bismuthinite carrying
80% of the metal
Tetradymite Bellwether
Bi recently been
identified in Cerro Rico
one Ton of Bismuth metal was
made at Loveland Colorado
in 1886
Combination gold ore in 1886
Carrying Bi

Wea. SAT. SEPT. 30, 1905 Ther.

The Bolivian Co – The Royal Saxon
Co & prospection of the
Cordillera Mountains –
Assay from 1.14 to 1.
187 oz.

Bi recently been found in
certain Copper Ores at Utah
from Mountain but none
worked

Several veins carrying Bi have
been found at a point 12 miles
West of Beaver City Utah
occur in Dolomite assay from
1 to 9 oz in Bismuth
Bismuth alone matter as sample
assay from 1 to 6% metal at
is thus been good result as
a concentrate ores etc goes
for 5 to 6 cts at a Bismuthite
per sample per profitable [illegible]
how good Ores is Nature
Bi with gold & galena carrying

assay Ag in a Quartz specimen
One of the mines, "The Diamond"
in Granite district, discovered
deadwood in 1895 shipped a little
ores in 1897 which proved to
have carried Ag. The
developments are small
consisting of a number of short
prospecting shafts & tunnels
In Colorado — number of
Co companies organized
for developing Hinsdale
Boulder, Jefferson, Lake, Ouray
& San Juan Cos.
in the ores of San Juan
North Star Consolidated
established several years ago
a small smelter in
the Gunnison valley

Lake City Weekly Hinsdale
Co shows $1,250,000
carrying Ag at rate of
1.544 oz to Ton —
A graph assay impure specimen
found near Tucson
Arizona
Bi is reported occurring
in Bank of Mount Vesta via
Alaska —
1905 U.S. Geo Surv. Bi
Both production & price
increased by Johnson
Wallingford & Co. Lessees —
Bi Cost of Dorsey
Says Colorado has produced
Number of Bi minerals
largest quantity of

Wea. TUES. OCT. 3, 1905 Ther.

Near Dodaville
Tamaulipas Mexico
a vein been opened
for 900 ft which is from
20 inches to 4 ft in width
Carries Bismuthinite
ore averaging 14% Bi

Near Newfoundland
Boxelder Co Utah
Bi ore high grade
reported to occur
associated with Copper ore

Inyo Co California
at Antelope northern side
of Death Spring Valley
large fault vein being
Comp where at shown
Red Bi Carb ores found

Wea. WED. OCT. 4, 1905 Ther.

see p 236 Oct 1888
Cal State geol Surv
Somerville in Grafton Co
NH in yellowish white
Encrustations —

Tetradymite Te 48 Bi 52
occurs in Va at Whitehall
gold mines Appalachian Brown Co
Monroe mine Stafford Co
Lehigh mine Lackawanna Co
in NC, Davidson Co about 5
in west of Cornelius mine
of Chalcopyrite scale & bar
Monroe along w/ Au Chalcopy
in quartz Epidote, Lemonite,
in Spring Sunapkin Co
4 mi E of Deadwood
also in Cheyenne & Pleh Co

Ore sublimes at 180 Cent
So Can be outlined in [illegible]
better see of yellow sublimate from
Preparing H_2SO_4 in reading
Red fuse — Nitrate only.
Sulphur

Tray Roasted ore overheated
by H_2SO_4 with powder
Copper — or Carbonates
Copper by reducing Cu by
Iron —

Dissolve Roasted ore in H_2SO_4
add Zinc & Dilute [illegible]
Cuts & [illegible] Bronzes
Brasses — [illegible]
all gone — [illegible]
by Zinc [illegible]
then precip the Ag by
KOH,

pass H_2S thro Weakles
Sulphur & then through
Roasted also [illegible]
ore

[illegible] powder with
Chlorinum — also $CoCl_2$

Dissolve Roasted ore in
H_2SO_4 — then add iron
Turnings & precipitate the
Co & Ni. wash precip
use the Sulphate Fe_2
to covers Wad & fractionate
by Crystallizing the Co Ni
Sulphates & separate Nickles
[illegible]

Sources Bromuth
Lake Co furnished 253 Tons
in 1900, Ouray Co 65 Tons
6 to 12% ore both Lead & Copper
1 & 2 oz gold 5 to 6 oz silver
price $8 to $11 per 20 lbs in
ore, went to Pittsburg Mahoney & G.
Limited — it was purchased
for them by the Leadville
Sampler. The State ore
Sampling works at Denver
pricing
10% ore 150 Ton 15% ore
250 20% $350, 30% 550
40% 750 50% $1000 ton.
Bi found in Chaffee Co
Selenium, Lavender Color, in
San Juan Co Colorado
Section. Between Maggie
& Picayune gulches on
Red Peak is the Bismuth
ore, disclosed leaving gold &
Mn Cu & the principal minerals

Pool (very fine rose red)
Co Mn Arsenide —
with Sulphide soda in
excess — then forms As
Sulfide which dissolves
& leaves Co Mn Fe Ag
Sulphides —
Use weak acid &
dis out the iron —
Then roast &
dis in H_2SO_4 —

Precip Sulfate Co Ni
by 33% hot. Throw
down the Co from
Ni & Co, some ammonia &
oxalate deposit the Co
we see Co ppt out

Wea. MON. OCT. 9, 1905 Ther.

Heard of grinding Reg H_2S in sol of [illegible] compd

Na_2O	1 mol in 1 Litre	31 .5
$2NH_3$	" "	8 .10
BaO	1 " in 10 "	BaO .90
MnO precipitd		.10
FeO "		FeO .30
ZnO "		.30
PbO "		13 .3
CuO "		.8
HgO "		25 .35
Ag_2O "		24 .35
		27 .90

Lecture 6 of Engineering News

also Engineering Magazine

Wea. TUES. OCT. 10, 1905 Ther.

Lecture [illegible] further

~~Amal~~ Sul phide with

Na OH Precipitating $Zn(OH)_2$

Normal - Mg ord Comp

Nacatte ~~[illegible]~~ first Na_2O

Then ~~[illegible]~~ get $Zn(OH)_2$ and

then [illegible]

Tells Sul Copper +

dis mil CuO by Hg

which remains and

NaOH, or fundamental

Solvent for CuO ppt

NaOH, get precipitating

Tells Alumina

Tells Manganous OH Then would

all Cases but in battery

precipitating some solvent [illegible]

Wea. WED. OCT. 11, 1905 Ther.

Make 2 iron [illegible] plates with [illegible] holes [illegible] drill [illegible]

Roll with water [illegible] a [illegible]

[illegible] pure powder [illegible] in permanganate

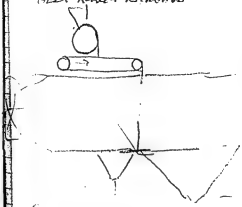
Prepare [illegible] [illegible] water [illegible] & [illegible]

Prepare [illegible] Nitrate Bi + [illegible] with Nitrate [illegible] & Red [illegible]

Wea. THUR. OCT. 12, 1905 Ther.

[illegible] K ferricyanide & potassium [illegible]

Dig 1st Cardand & Blow to [illegible] [illegible] Dinbrose



Dec of Dinbrose or Cascade in Mt Aspiria

Prepare [illegible] of 33 7 [illegible] 66 7 [illegible]

Pass 30 mach - Dry & pulf out [illegible] with [illegible]

Pass [illegible] Magnesium [illegible] [illegible] Bi [illegible]

Hel Gold Mines

Precipitate H2S in acid Sol.

	Mo	Hg	Bi
	Sb	Ir	Au
	Sn	Se	Cu
	Au	Tc	Ag
	Pt		Cd

Not acid

Sol. Pb

So only precip. compounds from solute not the metals

that metals precip. very slowly

Precip by ammon. sulph. in presence of ammonium

Ni Co Fe Mn Zn

as oxides

Al - Be Cr Tantalum +

alkali earth metals

as sulphs

Mg - Ca Sr Ba.

Det. if pay rolls of Crush found by NO1 Co ore samples

see if can separate silver by flakes,

also Crush 1/2 pounds to 100 mesh & Cyanide 3 or 4 days 1/2 %

watch screen for flakes -

also try Chlorine - Bromine

also Hg & dissolve out by Hyp. Sulph. Na or NH4 Cl.

The chances are that rich Silver is free & there is also argentite

870 mily to pound of ore

to detect Ag metallic

Crush 20 mesh &

pass dry H2S gas through make get black

Wea. SUN., OCT. 15, 1905 Ther.

Try 80 [illegible]

Try group of Mi plated tubes only which is plated Cobalt,

group 1/2 Mi 1/2 Co flake

Look up the Wo Mo Cr mixture with 1/2 cent to Ralph

As Co flake makes good Contrast with Mi flake tubes but not Co flake in long run — only Mi 1/2 Iridium flake with Co flake for metallic Contrast

the Co flake serving for Mi (Ott) 2 Contrast

70 grams 25 Co flake
10 Mi flake 1/2 Iridium

Wea. MON. OCT. 16, 1905 Ther.

Wea. SAT. OCT. 21, 1905 Ther.

Wea. SUN. OCT. 22, 1905 Ther.

3 | 3130
1043

3 | 3225
1075

3 | 3167
1056

3 | 3137
1046

3 | 3211
1070

3 | 3020
1006

3 | 3289
1096

3 | 3158
1053

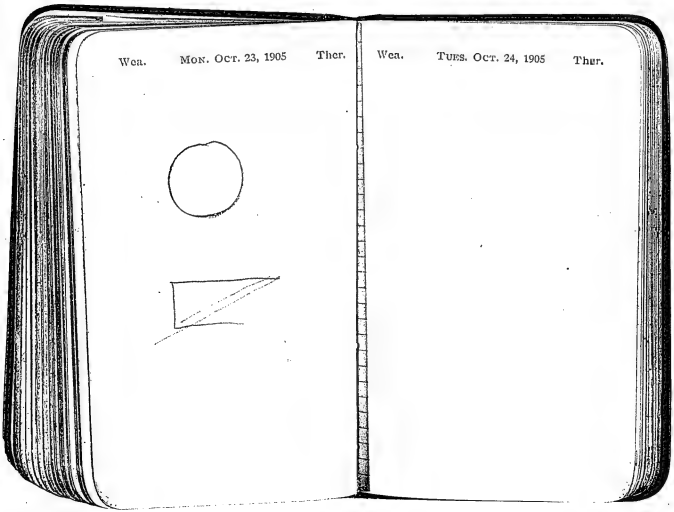
3 | 3221
1074

3 | 3289
1096

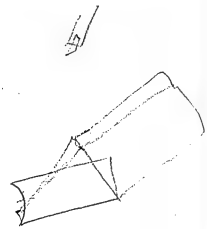
1 1043
2 1075
1 - 1056
2 - 1046
1 1070
2 1006
1 1044
2 1096
1 1074
2 1053

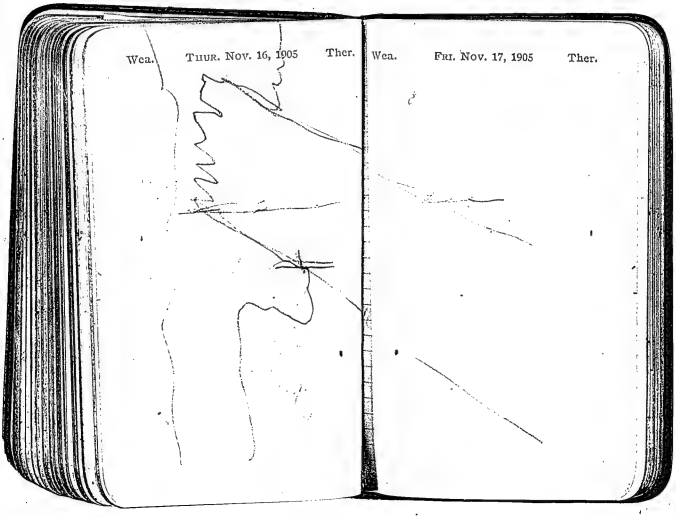
2 — 1067
1 - 1057

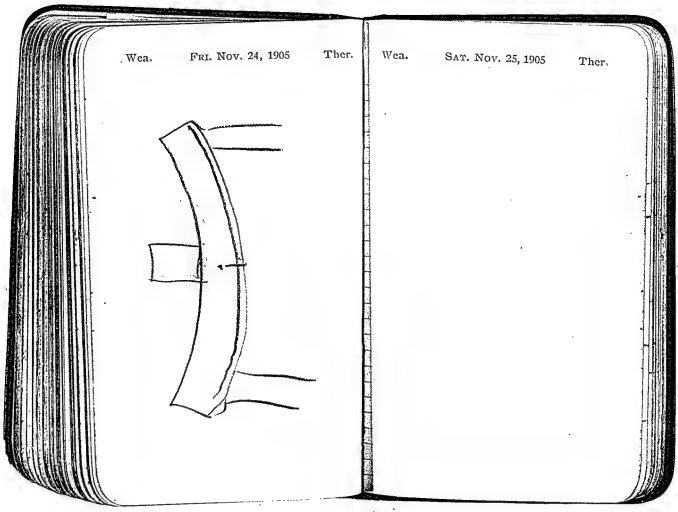
1053
1096 1043
~~1096~~ 1056
1046 1070
1075 1044
4270 1074
1067 | 3287
1057


Wea.
Mon. Oct. 23, 1905
Ther.
Wea.
Tues. Oct. 24, 1905
Ther.

Wea. FRI. OCT. 27, 1905 Ther. Wea. SAT. OCT. 28, 1905 Ther.




Wea.
Thur. Nov. 16, 1905
Ther.
Wea.
Fri. Nov. 17, 1905
Ther.


Wea.
Fri. Nov. 24, 1905
Ther.
Wea.
Sat. Nov. 25, 1905
Ther.

Wea. THUR. Nov. 30, 1905 Ther.

Wea. FRI. DEC. 1, 1905 Ther.

	Aug	July
Quarry		
Operating Labor	.067	.086
Repair "	.009	.019
Stripping "	.014	.019
Supplies & Renewals —	.011	.013
Coal	.011	.014
Dynamite	.017	.046
	12.9	19.7
Output	43520 Tons	33451
Railroad		
Operating Labor	.015	.021
Repair	.015	.022
Supplies & Renewals	.006	.008
Coal	.005	.005
	.041	.056
Tons	44920	33451
Crushers		
Operating Labor	.025	.030
Repair "	.014	.013
Supplies & Renewals	.004	.010
Coal	.006	.007
	.049	.060
Tons	42920	33451

Wea. SAT. DEC. 2, 1905	August	Ther. July
Mixing + weighing		
Operating Labor	.013	015
Repair "	001	001
Supplies + renewals }	001	003
Coal	015	019
Tons	66.144	66.150
Chalk		
Operating Labor	036	043
Repair "	009	010
Supplies + renewals	010	013
	055	066
Tons	43356	35376
Kiln Plant		
Operating Labor	019	020
Repair "	005	006
Wheeling Clinker	006	005
Supplies + renewals	009	005
Kiln Coal	11.6	11.5
	15.8	1.51
Bbls	114395	104062

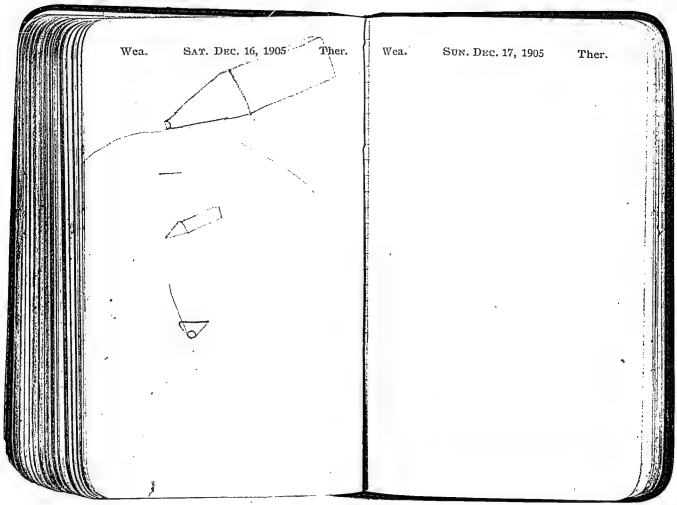
Wea. SUN. DEC. 3, 1905	Aug	July
Coal Plant		
Operating Labor	005	006
Repair "	001	
Railroading Coal + Pile top }	002	001
Supplies + renewals }	—	
	008	007
Bbls	104062	114395
Clinker Grinders		
Operating Labor	012	016
Repair "	010	010
Supplies + renewals	005	006
	027	032
Bbls	120372	96069
Gypsum	034	034.
Pkg + Shipping		
Pack + Labor at Pkg	017	016
Office Wages + Expenses	002	003
Repair Labor	005	009
Supplies + renewals	001	001
	025	029
Bbls	121709	83558

Wea.	Mon. Dec. 4, 1905	Cleaning	Ther. Jerky
	Machine shop		
	Oper'g Labor	.048	.052
	Supplies & renewals	.016	.017
	Coal	.002	.003
		.066	.072
	Clinker Tons	21735	19772
	Electrical Dept	.058	.066
	Oper'g Labor	.009	.004
	Repairs "	.017	.022
	Supplies & renewals	.054	.002
	Tons clinker	21735	19772
	Power Plant		
	Oper'g Labor	.141	.149
	Repairs "	.008	.018
	Supplies & Renewals	.034	.031
	Coal	.350	.434
		533	.632
	Tons clinker	21735	19772

Wea.	Tues. Dec. 5, 1905	Cleaning	Ther. Jerky
	Oil system		
	Oper'g Labor	.034	.035
	Repairs "	.007	.006
	Supplies & renewals	.015	.014
	Miscellaneous supplies	.014	.013
		.070	.068
	Tons clinker	21735	19772
	Yards		
	Oper'g Labor	.031	.030
	Supplies incl. sodate	.005	.007
		.036	.037
	Tons clinker	21735	19772
	Offices		
	Oper'g Labor	.060	.057
	Supplies pstg & memoranda	.024	.032
	Superintendence & clerks	.021	.027
		10.5	12.0
	Tons clinker	21735	19772

Wea.	WED. DEC. 6, 1905	Ther.
	avg	Det.
Labor & Cong		
Operg Labor	041	04
Supplies & renewals	007	00
	048	04
Tons Clinker	21735	19772
Conveyors.		
Operg Labor	036	03
Repair "	002	
Supplies & Renewals	058	.061
	12.6	19.6
Tons Clinker	21735	19772
RR Main Line to Pfizer		
Operating Labor	015	017
Repair "	015	.018
Supplies & Renewals	007	.008
Coal	005	.03
	042	048
Tons clinker	19772	21735

Wea.	THUR. DEC. 7, 1905	Ther.
Individual Costs		%
Operating Labor	25368	36.9
Repair Labor	5632	08.5
Pfizer	787	01.1
Rotary Kilns Rodman	290	00.4
Blacksmith Fillers & Pinders	2704	04.0
Supplies & renewals	2713	04.0
Rotary Kilns	13306	19.5
Coal for all Power	8789	12.7
Power Surgers	605	01.0
Cement	3983	05.8
Fuel oil	298	00.5
Supplies & renewals	733	01.1
Superphosphate Sulphuric	472	00.7
Power & Lamps	1672	02.4
Superphosphate & Ammoniacum	310	00.5
Superphosphate & Ammonia	605	00.9
	68464	100.0%


Wea.
SAT. DEC. 16, 1905
Ther.
Wea.
SUN. DEC. 17, 1905
Ther.

Wea.	Wind Cond	Dec. 20, 1905 Water	Ther. Rev.	Wea.	Thur. Dec. 21, 1905	Ther.
1043 —	2"	1/7 —	308			
1048	1/4	5/8				
1058	7/8	1.3/8	436			
	1/4 —	1 1/2				

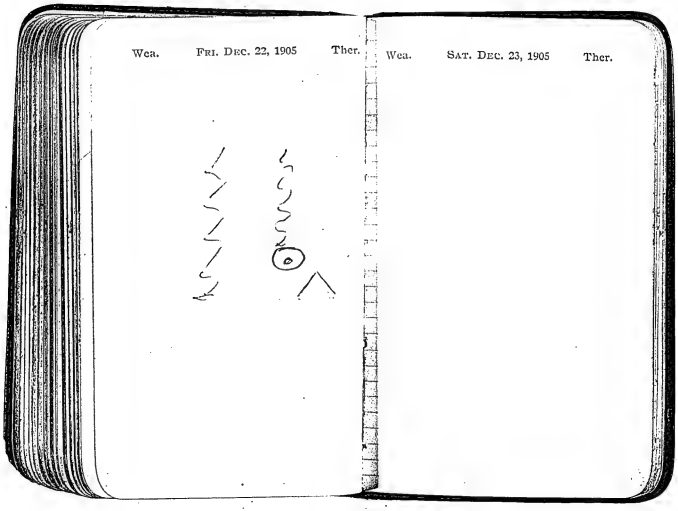
116 —
90
26
13.0
11.0
2.5

116 —
90
26
13.0
11.0
2.5

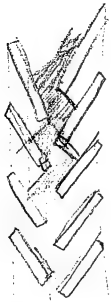
160
45
800
640
720

2.588
5.72 = 147
57

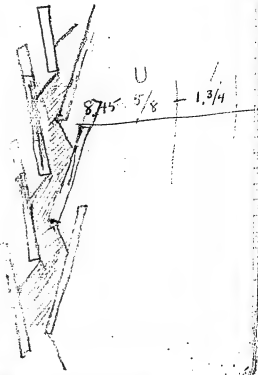
160

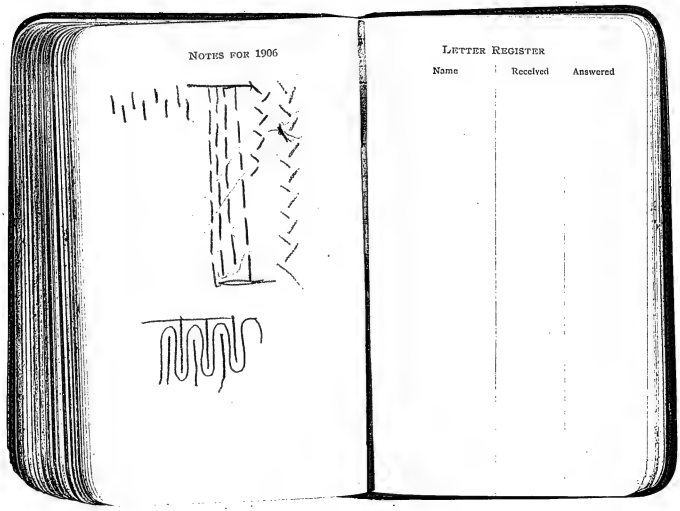

Wea.
Fri. Dec. 22, 1905
Ther.
Wea.
Sat. Dec. 23, 1905
Ther.

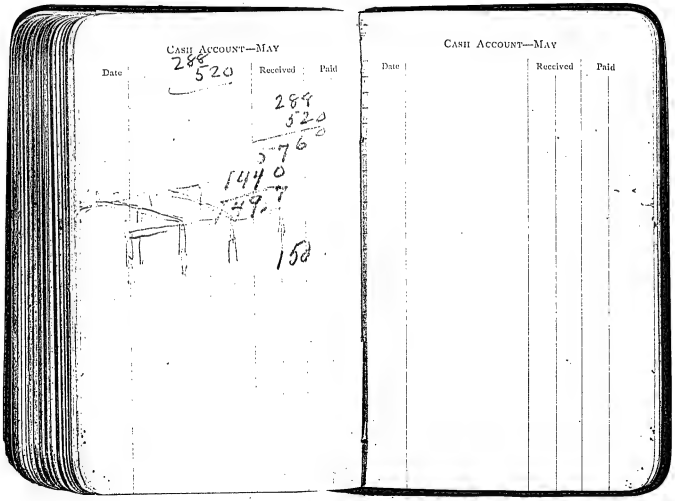
Wea. THUR. DEC. 28, 1905 Ther.

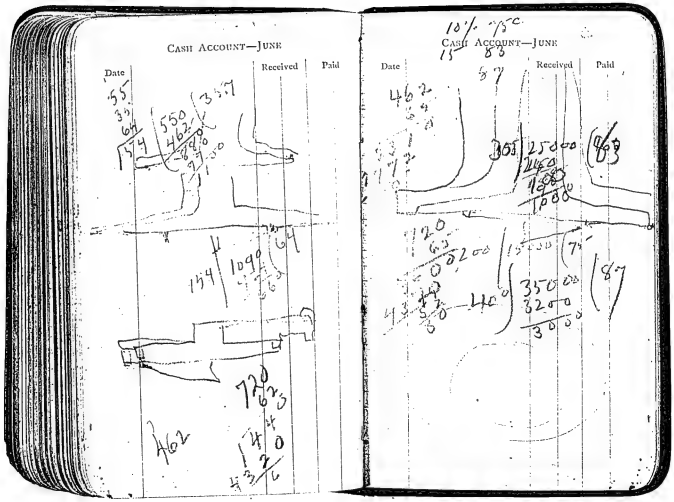


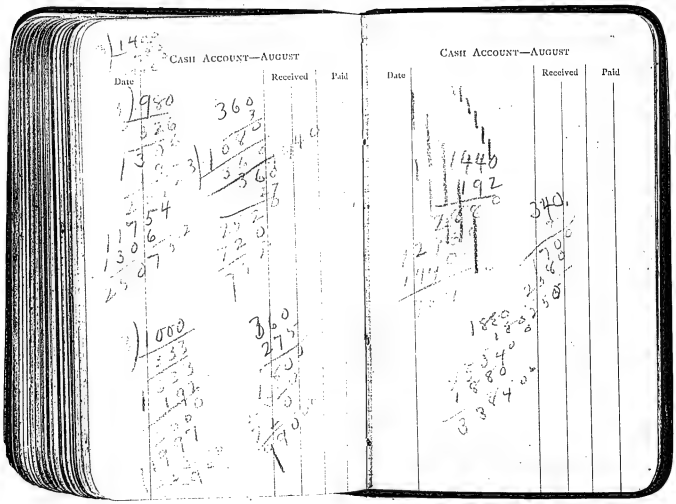
Wea. FRI. DEC. 29, 1905 Ther.

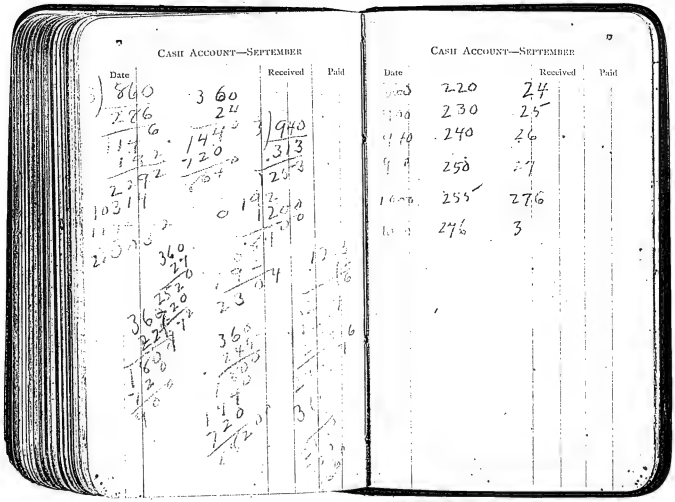



NOTES FOR 1906
LETTER REGISTER
Name
Received
Answered


Cash Account—May
Date
Received
Paid
288
520
288
520
576
1440
297
150
Cash Account—May
Date
Received
Paid


Cash Account—June
Date
Received
Paid
Cash Account—June
Date
Received
Paid


Cash Account—August
Date
Received
Paid
Cash Account—August
Date
Received
Paid



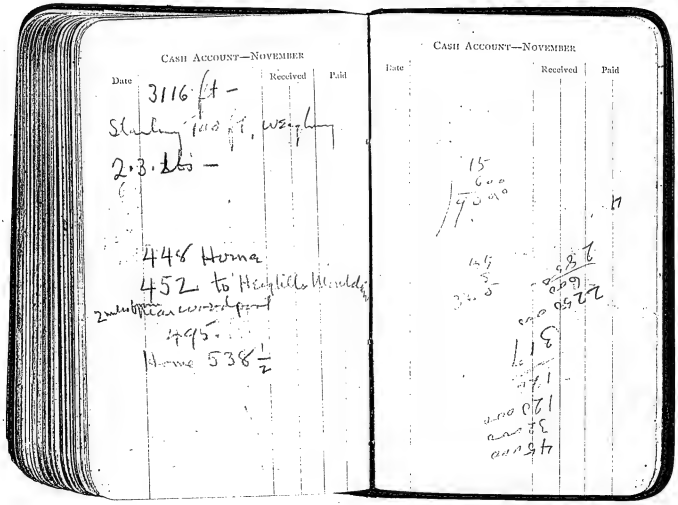
CASH ACCOUNT—SEPTEMBER

Date		Received	Paid
	220	24	
	230	25	
	240	26	
	250	27	
	255	27.6	
	276	3	

CASH ACCOUNT—SEPTEMBER

Date		Received	Paid
	860	360	
	286	24	
	6	144	
	1	120	
	2	12	
	2	9	
	2	2	
	1031	1	
	1	2	
	2	3	
		360	
		27	
		20	
		2	
		2	
		20	
		2	
		7	
		360	
		27	
		9	
		160	
		3	
		6	
		4	
		120	
		12	
		2	
		940	
		313	
		2	
		1	
		2	
		0	
		12	
		20	
		0	
		4	
		3	
		4	
		23	
		36	
		27	
		9	
		6	
		4	
		3	
		6	
		4	
		1	
		120	
		12	
		2	

Cash Account—October
Date
Received
Paid
Cash Account—October
Date
Received
Paid



CASH ACCOUNT—NOVEMBER

Date		Received	Paid
	3116 ft –		
	Sterling 100 ft, weighing		
	2.3. lbs –		
	448 Horna		
	452 to Heights Mendel		
	2nd hand American wood pump		
	495.		
	Horna 538 1/2		

CASH ACCOUNT—NOVEMBER

Date		Received	Paid
	15		
	600		
	90.00		
	45		
	3.5		
	2250.00		
	3.1		
	120.00		
	32.00		
	45.00		

CASH ACCOUNT—DECEMBER

Date		Received.	Paid
	[illegible]		
	[illegible]		
Nov 20	—	9 [illegible]	
" 21	—	[illegible]	
[illegible]		100	
Mortgage Nov 23	—	98 4/5	
		737	
256			
256			
2048			
2048		3 145	
512		13	
7372		60	

180
108
737
343

60.

9
5.12
1420
1893
6820
8.713
Thomas Edison
Orange
N.J.

A Note on the Sources

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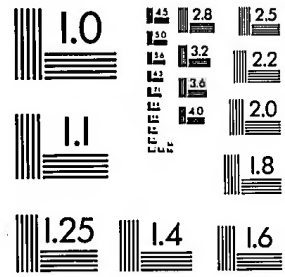

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